JUL 2 3 1928

VOLUME X NO. 3

JOURNAL of FARM ECONOMICS

JULY, 1928

CONTENTS

	Page
The First-Year Awards of Graduate Fellowships in Agricultural Economics and Rural Sociology. *E. G. Nourse*	277
Development Methods and Results of Agricultural Economic Research in the United States. *Sigmund von Frauendorfer*	286
State Indexes of Prices of Farm Products. *Albert G. Black* and *Dorothea D. Kittredge*	312
Cooperative Marketing of Grain in the United States and Canada. *J. F. Booth*	331
A State Program of Farm Organization Research. *H. C. M. Case*	357
The Contribution of Farm Management in the Development of Agricultural Extension Programs. *H. M. Dixon*	375
Farm Management Demonstrators' and Agricultural Extension Programs. *E. Merritt*	384
Types of Economic Material Used in Developing an Agricultural Program in North Dakota. *O. M. Fuller*	392
Book Reviews	397
Book Notes	406
Recent State Publications	408
Publications from the Bureau of Agricultural Economics	415
Lists of Candidates for the Doctors' and Masters' Degrees in Agricultural Economics in American Universities and Colleges—Summary	417

Published Quarterly by
THE AMERICAN FARM ECONOMIC ASSOCIATION
Publication Office: 450 Ahnaip Street, Menasha, Wis.
Executive Office: W. I. Myers, Secretary-Treasurer,
Cornell University, Ithaca, N.Y.

Price: $5 per year, this issue $1.25

Entered as second class matter at the post office at Menasha, Wis.

The American Farm Economics Association

President—L. C. Gray—Bureau of Agricultural Economics.
Vice-President—M. R. Benedict—South Dakota Agricultural College.
Secretary-Treasurer—W. I. Myers—Cornell University.

PAST PRESIDENTS

William J. Spillman	1910-12
George F. Warren	1913
Daniel H. Otis	1914
Andrew Boss	1915
Harcourt A. Morgan	1916
Henry W. Jeffers	1917
George A. Billings	1918
John R. Fain	1919
Henry C. Taylor	1920
Walter F. Handschin	1921
Benjamin H. Hibbard	1922
Thomas P. Cooper	1923
Edwin G. Nourse	1924
Milburn L. Wilson	1925
Thomas Nixon Carver	1926
J. I. Falconer	1927

LOCAL FARM ECONOMIC ASSOCIATIONS

District of Columbia Chapter, Washington, D.C.
Cornell University, Ithaca, New York.
University of Wisconsin, Madison, Wisconsin.
Iowa Agricultural College, Ames, Iowa.
Kansas Agricultural College, Manhattan, Kansas.
North Dakota Agricultural College, Agr. College, North Dakota.
Western Farm Economists, Reno, Nevada.

THE JOURNAL OF FARM ECONOMICS, EDITORIAL STAFF

Editor—H. R. Tolley, Bureau of Agricultural Economics.
Associate Editors—J. D. Black, Harvard University.
H. E. Erdman, University of California.
W. E. Grimes, Kansas State Agricultural College.
S. W. Mendum, Bureau of Agricultural Economics.
F. A. Pearson, Cornell University.

Inquiries regarding membership and general affairs of the Association should be addressed to the Secretary-Treasurer. Manuscripts or inquiries concerning the Journal should be addressed to the Editor or any one of the Associate Editors.

JOURNAL
of
FARM ECONOMICS

VOL. X JULY, 1928 No. 3

THE FIRST-YEAR AWARDS OF GRADUATE FELLOWSHIPS IN AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

E. G. NOURSE[1]
INSTITUTE OF ECONOMICS

On April 6 and 7 the special Committee on Graduate Fellowships in Agricultural Economics and Rural Sociology, appointed by the Social Science Research Council, met in Washington to consider the applicants and to make a preliminary grouping. Professor Fetter of Princeton University, Dr. Galpin and Dr. Spillman of the Bureau of Agricultural Economics, and the Chairman of the Committee were in attendance, and 95 application blanks and supporting material had been submitted for the consideration of the Committee. The first task was to make a rough division between those who were clearly ineligible, or whose particular proposal of work did not appear to the Committee to meet fully the intentions of the Social Science Research Council in providing this fellowship fund. Along with this task of segregation, it was necessary also in this preliminary consideration to rank the applicants in groups according to their qualifications, probable return in service and leadership, and the pressing character of the need or possi-

[1] Dr. Nourse served as Chairman of the Committee, the other members being Dr. Joseph S. Davis, Food Research Institute, Stanford University; Dr. Frank A. Fetter, Princeton University; Dr. C. J. Galpin, United States Bureau of Agricultural Economics; Dr. W. J. Spillman, United States Bureau of Agricultural Economics, and Mr. Henry A. Wallace, *Wallaces' Farmer*, Des Moines.

bility of the candidate's taking advantage with equal facility of the awards in later years.

On this basis, the Committee spent its first day in gaining an acquaintance with the candidates, and arranging them in five general groups. Group 1 consisted of a small number of candidates of outstanding merit, and Group 2 of a very large number whose qualification and promise were such as to warrant the Committee in granting each of them an award had funds been available. However, it was obvious that with only eighteen, or at the outside twenty, appointments available, only a small number even of those falling in Group 2 could actually be given stipends when the final decision was made.

Accordingly, the Committee set itself a second task of re-examining the applications of Group 2 and subsorting them into "2+," "2," and "2—" groups. Again the top group was small and the middle group large, so that it appeared that practically all of the 2+ men would join the original Group 1 men, becoming practically certain of an award, whereas there was an even more acute question as to which men out of the really excellent material in Group 2 should now be selected for the very limited number of additional awards which could be made beyond those presumptively going to Groups 1 and 2. In order to determine this question, it was necessary to have consideration by the full membership of the Committee, and also to make whatever further inquiry was possible as to all the individual candidates. Sets of application blanks and supporting material for those in the three upper groups were accordingly sent to Dr. Davis and Mr. Wallace, two members of the Committee not in attendance at the preliminary meeting. This was to afford them an opportunity for familiarizing themselves with the whole situation as fully as possible before the final meeting of the Committee, which was set for three weeks later. Various members of the Committee also prosecuted further inquiries both in person and by correspondence, clearing up questions which were not fully covered in the original application blanks, and also getting the judgment of various people who were personally familiar with the candidates.

On April 30 a final meeting of the Committee was held in Washington with all six members in attendance. After reviewing the classifications already tentatively made, and making some shifts of position in the light of fuller information, the Committee finally developed a list of 28 names, which comprised 18 definite appointments, 4 alternates, and 6 reserve alternates. While there was of course no real possibility that the reserve alternates could be appointed, nor any great probability that more than one or two members of the alternate group could be reached, the Committee had been so loath to drop these men in the rigorous elimination which was necessary that their names still stood on the list when the Committee adjourned, and are presented here as at least a slight recognition of the high rank which they held in our consideration. The full list is as follows:

Appointees

Bell, Edward J. Jr., Montana Agricultural Experiment Station
Benedict, M. R., South Dakota State College
Bjorka, Knute, Iowa State College
Frey, Fred C., Louisiana State University
Gans, A. R., University of Vermont
Hensley, H. C., University of Missouri
Hodges, J. A., Kansas Agricultural College
Hutson, John B., United States Bureau of Agricultural Economics
Mumford, D. Curtis, University of Minnesota
Purves, Clarence M., United States Bureau of Agricultural Economics
Roth, Walter John, University of Minnesota
Saville, R. J., North Carolina State College
Schaars, Marvin A., University of Wisconsin
Taeuber, Conrad, University of Minnesota
Walker, Arthur L., New Mexico College of A. and M. Arts
Wileden, Arthur F., University of Wisconsin
Willard, Rex E., North Dakota State College
Willson, Edwin A., North Dakota State College

Alternates

Watkins, D. W., Clemson Agricultural College
Seeley, Burton D., Colorado Experiment Station
Ross, Robert C., University of Illinois
Commons, John L., University of Wisconsin

Reserve Alternates

Richards, H. I., ex-United States Bureau of Agricultural Economics
Sallee, George A., University of Minnesota

Watson, J. L., Texas A. and M. College
Timmons, D. E., University of Florida
Stover, H. J., Cornell University
Galloway, Z. L., University of Kentucky

Mr. Mumford declined his appointment, as he had, while the applications were pending, accepted a position with the United States Bureau of Agricultural Economics, and Mr. Walker found it necessary to withdraw on May 31.

In the matter of stipends, the Committee found itself confronted with serious difficulty and torn by a desire on the one hand to make the awards so liberal as to show real recognition of the candidate's merit and facilitate his carrying through his plans without financial stringency, and on the other hand of assisting as many as possible of the men of excellent qualifications who had applied. Many of these men were married and with children ranging from one to four in number. Sabbatical leaves are not numerous in our agricultural colleges, and hence the men contemplating graduate training had to forego a year's salary or at least a large part of it. After weighing all of these considerations, the Committee finally worked out a scale ranging from $750 for young and unmarried men to $2,250 for those with the heaviest family obligations.

Naturally also the cost of tuition and expense of living at the various institutions had to be taken into account. In dealing with the former question, it was decided to make awards on the basis of tuition fees being paid by the appointee, and then to take up with the several universities the question of whether fees would be remitted to students coming on fellowship appointments from the Social Science Research Council. It was hoped that, as the Council had provided some funds and the candidates were themselves making a financial sacrifice and outlay to secure this much-needed training for the enrichment of research work in our several institutions, the universities themselves would cooperate to the extent of remitting tuition. This request has been freely granted by the University of Wisconsin and the University of Minnesota. The other universities find themselves less willing or less able to make the same arrangements, and it is not certain at the present time what

the final adjustment will be. Apparently, the remission of tuition and the resignation of two appointments will produce a reversion of funds in sufficient amount to make at least a moderate grant to all those on the alternate list.

Inasmuch as a few applications, delayed for reasons which seemed valid to the Committee, were received after the first meeting, there was a total of 100 applications, and final awards can only slightly exceed the ratio of one to five. It is expected, however, that a considerable number of those who could not be accommodated this year will renew their applications in subsequent years, and a fair number of them should receive grants at some time during the five-year period. It seems possible that a larger number of older men may have been included in the first year's group, and that their stipends, being necessarily large, have somewhat reduced the total number of awards which could be made. If more junior men should appear in the later years and be given stipends averaging slightly lower, it might be possible during the five-year period to take care of a total of 120 or 125 men. This should promote and hasten the training of a quite exceptional group of workers in the fields of agricultural economics and rural sociology, and exert an influence which would be felt for a long time and in practically all parts of the country.

It is expected that the final date for the filing of applications will be set considerably earlier next year in order that awards may be announced prior to the time when staff arrangements are being made in the various colleges and experiment stations. This date will probably not be later than February 1, so that announcements may be made by March 1. It seems well, therefore, for prospective candidates to take these fellowship awards into account practically from the beginning of the new academic year.

It has been suggested that readers of the JOURNAL might be interested in a brief analytical discussion of the geographical dispersion of candidates and appointees, of the institutions for which a preference was expressed, and of the fields of work and types of training indicated on the application blanks. The following table presents some data as to dispersion.

TABLE 1.—STATES AND INSTITUTIONS FROM WHICH APPLICATIONS WERE RECEIVED

State[1]	Name of Institution	Number of applicants	Number of appointees
Arizona	University of Arizona	1	
Arkansas	University of Arkansas	1	
California	University of California	1	
Colorado	Colorado Experiment Station	1	1
District of Col.	Bureau of Agricultural Economics	6	2
Florida	University of Florida	3	
Georgia	University of Georgia	1	
Georgia	Savannah Central High School	1	
Idaho	Ashton High School	1	
Illinois	University of Illinois	3	
Illinois	University of Chicago	1	
Illinois	Garrett Biblical Institute, Northwestern University	1	
Illinois	Institute for Research in Land Economics	2	
Illinois	Chicago Mission Society	1	
Iowa	Iowa State College	3	1
Kansas	Kansas State Agricultural College	2	1
Kentucky	Agricultural Experiment Station	1	
Kentucky	Bureau of Agricultural Economics	1	
Kentucky	Southern Baptist Theological Seminary	1	
Louisiana	Louisiana State University	1	1
Louisiana	Urania High School	1	
Maine	University of Maine	1	
Massachusetts	Harvard University	2	
Massachusetts	No institution	1	
Minnesota	University of Minnesota	8	2
Minnesota	Pine City High School	1	
Missouri	University of Missouri	1	1
Missouri	Park College	1	
Missouri	Southwest Missouri State Teachers' College	1	
Montana	Montana Experiment Station	1	1
Nebraska	Nebraska School of Agriculture	1	
New Jersey	University of New Jersey	2	
New Jersey	Pacific Egg Producers	1	
New Mexico	New Mexico College of Agriculture	1	1
New York	Cornell University	7	
New York	Ellenville High School	1	
New York	On farm	1	
North Carolina	North Carolina State College	1	1
North Dakota	North Dakota State College	2	2
Ohio	Ohio State University	2	
Ohio	Wesleyan University	1	
Oklahoma	University of Oklahoma	1	
Oregon	Oregon State Agricultural College	3	
South Carolina	Clemson Agricultural College	3	1
South Carolina	Seneca High School	1	
South Dakota	South Dakota State College	1	1
Tennessee	University of Tennessee	2	
Tennessee	Livingston Academy	1	
Tennessee	Cookeville High School	1	
Texas	Texas A. and M. College	3	
Utah	Utah Agricultural College	1	
Utah	Brigham Young University	1	
Vermont	University of Vermont	1	1
Virginia	Virginia Polytechnic Institute	1	
West Virginia	County Agent	1	
Wisconsin	University of Wisconsin	6	3
Wyoming	University of Wyoming	1	
Foreign		1	
		100	20

[1] No applications were received from persons in Alabama, Connecticut, Delaware, Indiana, Maryland, Michigan, Mississippi, Nevada, New Hampshire, Pennsylvania, Rhode Island, or Washington.

The application blank called for an expression on the part of the candidate as to the line of work which he desired to engage in, the institution at which he wished to prosecute

the work, and his professional position and plans. The information as to the candidates' professional standing is classified in Table 2.

TABLE 2.—PRESENT POSITION OF FELLOWSHIP CANDIDATES

Professor of Agricultural Economics	5[1]
Associate Professor of Agricultural Economics	1
Assistant Professor of Agricultural Economics	5
Instructor in Agricultural Economics	7
Assistant Instructor in Agricultural Economics	1
Professor of Rural Sociology	1
Associate Professor of Rural Sociology	1
Instructor in Rural Sociology	2
Assistant Instructor in Rural Sociology	1
Professor of Animal Husbandry	1
Associate Professor of Animal Husbandry	1
Professor in Teachers' College	2
Experiment Station Assistant Director	1
Experiment Station Chief of Section	1
Experiment Station Assistant	12
Research Worker, Non-station	4
Agricultural Economist, U. S. Bureau of Agricultural Economics	1
Associate Agricultural Economist, U. S. Bureau of Agricultural Economics	3
Assistant Agricultural Economist, U. S. Bureau of Agricultural Economics	1
Junior Agricultural Economist, U. S. Bureau of Agricultural Economics	2
Assistant Extension Director	2
Extension Specialist	8
County Agent	1
Teacher of Vocational Education	6
High School Assistant Principal	2
Teacher in Secondary School	1
Graduate Student in Agricultural Economics	16
Graduate Student in Rural Sociology	4
Undergraduate Student in Agricultural Economics	2
Farmer	1
No position	3
Foreign Service	1

[1] Two of these are Department Heads.

Some stress had been placed in the announcement of the fellowships upon the fact that the Committee desired definite information as to the objective which the candidates had in mind in planning further training along research lines. The answers were in many cases illuminating, but in not a few cases so inadequate as to be prejudicial to the rating of the applicant. Forty-two blanks indicated more or less clearly an intention to continue in the present line of work, and thirty-three could be interpreted as indicating that the applicant foresaw possibilities of advancement in the chosen field of work and expected the assistance derived through a fellowship to contribute to this end. In twenty-five cases, however, the question was left blank or answered by the statement that there was no definite place of employment or usefulness in sight. It may not be out of place to suggest again to those interested in the fellowships in fu-

ture years that the Committee attaches great importance to the definiteness with which it is indicated that the work of a fellowship year will contribute specifically to the candidate's service in the field of economic or social research.

A second phase of the information brought out by the application blank concerned the applicants' lines of specialized interest. Since many of them indicated quite properly a fairly wide range of major and minor interests, it was not always easy to state the special interest under a single heading. Even so, however, the rough grouping presented in Table 3 sheds some light on the subjects about which workers in the field are today concerned.

TABLE 3.—CANDIDATES' LINES OF SPECIALIZED INTEREST

Agricultural Economics	15	Rural Sociology	13
Marketing	15	Rural Institutions	5
Economic Theory	13	Rural Social Economics	3
Farm Management	6		
Prices	6		
Statistical Methods	4		
Production Economics	4		
Land Economics	3		
Cooperation	3		
Rural Credit	3		
Economic History	2		
Taxation	2		
Banking	1		
Tariff and the Farmer	1		
International Agricultural Problems	1		

Two questions related to the choice of institution at which work would be carried on. In this, there was no thought that the Committee would attempt to assign an appointee to a particular graduate school, but simply to secure from these and the question on special interest as full information as possible as to the definiteness of his objective and the probability that if the Committee put funds at his disposal he would be able to carry out effectively the purposes for which this grant was made through the good offices of the Social Science Research Council. The candidate formulates his own plans, and all that the Committee does is to approve those which to it appear most promising, and in these cases to make a grant of funds for carrying them out. Both first and second choices[2] are shown in Table 4.

[2] Some applicants suggested as many as five or six options.

TABLE 4.—PREFERENCE INDICATED FOR VARIOUS GRADUATE-TRAINING INSTITUTIONS

Name	*First Choice*	*Second Choice*	*Appointed*
Harvard University	21	8	5
Cornell University	19	8	4
University of Minnesota	13	15	2
University of Wisconsin	12	8	3
University of Chicago	11	6	2
University of Tennessee	7	..	..
University of California	4	1	..
Iowa State College	2	3	..
Ohio State University	2	2	..
Foreign	2	..	1
No Choice	2	..	..
Columbia University	1	1	1
University of Illinois	1	2	..
University of Kentucky	1	..	..
University of North Carolina	1	..	..
Northwestern University	1	4	..
Michigan State University	..	1	..
Stanford University	..	2	..
Texas A. and M. College	..	1	..
University of Missouri	..	1	..
University of Pennsylvania	..	1	..
University of South Carolina	..	1	..

In conclusion it may be stated that the Committee was greatly impressed with the quality of the candidates presenting themselves, and with the clear indication that the Advisory Committee on Social and Economic Research in Agriculture had sensed the situation correctly when they indicated to the Social Science Research Council that there was a great need of and eagerness for further graduate training in these fields, and that if financial assistance could be granted it would be effectively used for enriching the research work done during the next few years.

A first year is always something of an experimental period, and this was particularly true in the present instance owing to the haste with which the work had to be carried through after funds became available early in March. The Committee feels that it has learned much from the experience in administering the funds during this initial year, and has profited by suggestions made from a few outsiders. It is sincerely hoped that suggestions which undoubtedly will occur to other workers in the field will be passed on to the Committee to aid it in its further work.

DEVELOPMENT METHODS AND RESULTS OF AGRICULTURAL ECONOMIC RESEARCH IN THE UNITED STATES[1]

SIGMUND VON FRAUENDORFER
INTERNATIONAL INSTITUTE OF AGRICULTURE

"Agrarökonomik" is certainly not an attractive combination of words, and yet it is difficult to find another expression which is a short and comprehensive translation of the English "agricultural economics." What the American of to-day understands by "agricultural economics" can be accurately expressed neither by "Wirtschaftslehre des Landbaus," "Landwirtschaftliche Betriebslehre," "Agrarpolitik," nor "Agrarwissenschaft." These German expressions give only a part or one side of the content of the idea connoted by the American term. We see, then, from the beginning, that the organization of this science is quite different in Germany from that in the United States. It is one of the aims of this study to explain the organization of American scientific research in this field. In order to do this successfully, a survey of the development of this branch of research is necessary. And we must not limit ourselves to the external features of the development. We must study the history of its methods, that we may draw conclusions that will be of value to the corresponding science in Germany.

The history of agricultural economics in America covers a short period of time. It is not too much to say that this branch of science did not exist before 1900. All the more astonishing, then, is the fact that today, as we can calmly admit, America has outstripped all other countries in this field, at least as far as external characteristics are concerned, such as number of research institutions, of scientific personnel, amount of available funds, and number of publications. In the whole field of American agriculture to-day nothing is of such absorbing interest as economic questions, whether they affect the individual farmer, the

[1] Entwicklung, Methoden und Ergebnisse der Agraroekonomischen Forschung in den Vereinigten Staaten. Written for and published in "Berichte über Landwirtschaft" vol. 7. Berlin, 1928.

This translation is by A. M. Hannay, Library, Bureau of Agricultural Economics, U.S.D.A., and is here published with the consent of the publisher of the original article.

nation, or the whole world. It is also a remarkable fact that American farm economics, in contrast to many other phenomena of American life, is a native product. It bears practically no traces of foreign influence, if we except the indirect influence of European political economy.

In order to go back to the beginnings of agricultural economics, a preliminary study of one of its branches is advisable, namely, farm management. The first studies in this field were made under the deceptive light of the determination of cost of production. The ceaseless questioning of the practical man as to the connection between prices and cost of production caused the Government, as early as the middle of last century (1849, 1850), to undertake cautious attempts to estimate the cost of production of important agricultural products, such as corn and cotton. The first important investigation, however, was not made until considerably later, in 1893. The Division of Statistics of the Department of Agriculture, of which we shall speak at length later on, "because of numerous inquiries from home and abroad with regard to the cost of our chief grain crops," instituted an investigation which covered almost 30,000 wheat- and corn-producing farms all over the country. Almost simultaneously a number of experiment stations and land grant colleges attempted to solve similar problems in connection with local conditions in their own States. Most of this work was carried on by men who were interested in the technical rather than in the economic side of production. It is not surprising, therefore, that these earlier cost-of-production studies made use of the experimental method and based their findings on field plot experiment work. Characteristic examples of this are a bulletin of the Nebraska Experiment Station of 1893, which deals with a number of different crops, and publications of the Station in Wyoming for 1894 and 1895 dealing with wheat, and potatoes. In comparison with these more or less technical publications the economic viewpoint stands out more clearly in a bulletin written by N. A. Weston in which he attempts, with the help of questionnaires, to solve the problem of the cost of production of corn and oats under the conditions prevailing in Illinois.

All these publications had a more or less occasional and private origin. Farm management as an independent, generally recognized science, had not yet seen the light of day. The term "farm management" meant simply the practical administration of a farm, and had as yet nothing of the definite economic content which distinguishes it to-day. It required the initiative of energetic and far-seeing men to raise farm management to the rank of a clearly defined and generally recognized science. The first of these men who can be called the pioneers of American agricultural economics was W. M. Hays. The scene of his activity was the University of Minnesota, in St. Paul, which has remained one of the headquarters of agricultural economic research. Minnesota, too, had begun with cost of production studies made according to the experimental method, but Hays, who had directed this work since 1894, made a decisive step forward. In 1902, three "statistical routes" were established by him, which were composed originally of groups of 12 to 15 farms and later of 8 farms in each of three different districts of the State, with well-defined types of agriculture (dairying, meat production, grain growing). Assistants paid daily visits to the farmers on the route in order to observe and to make note of all the economic proceedings, particularly the utilization of labor. These investigations were carried on year by year with certain modifications, and the results were published in various bulletins.

From the beginning, the Federal Department of Agriculture in Washington was associated with this undertaking, and after this method had proved to be successful, it proceeded to interest other States in these investigations. In the process the method described underwent certain changes. Individual branches of farm management were singled out and subjected to a close analysis according to the principles of double-entry bookkeeping. The most important change, which originated in Washington, consisted in causing the farmer himself to supply the data and figures, whereas, according to the route method, all the work was done for him. Both methods are widely known to-day as "cost accounting methods," and are recognized

as one of the pillars of agricultural economic research, although in recent years the limits and the deficiencies of these methods have come to be more and more recognized. In addition to his work on routes Hays did not neglect the experimental method. In particular, at the beginning of his activity in Minnesota (1894), he conducted a series of long-time experiments in crop rotation, with the practical aim of finding out the crop rotation which would produce the greatest net yield per unit of area under conditions prevalent in Minnesota. We mention in passing that Hays also took a deep interest in his work as a teacher in which he was also a pioneer. As he was called to Washington, however, in 1905 as Assistant Secretary of Agriculture, the work which he had started in Minnesota was carried on later in large measure by his co-workers and pupils, of whom Andrew Boss and T. P. Cooper deserve special mention.

At the same time as the statistical routes were established in Minnesota, the Department of Agriculture in Washington began to take an active interest in the new science. It is true that the Government in the second half of the nineteenth century had taken enough interest in the economic condition of the farmer to compile in the Division of Statistics, established in 1863, an increasing amount of statistical material relating to agriculture. We see that incidentally the question of cost of production was also dealt with by this office. However, there was in the beginning no question of actual scientific work along this line. The situation was changed when in 1901 W. J. Spillman, of the Bureau of Plant Industry, was officially appointed to engage in research in the field of farm management. That lasted several years until a separate Office of Farm Management was established (in 1905) which remained until 1915 under the jurisdiction of the Bureau of Plant Industry. Spillman had originally studied the technical side of agricultural production. His former specialties were grasses and forage plants. But even in 1902 an article of his appeared in the Agricultural Yearbook on systems of farm management in the United States. Spillman's concept of farm management was limited at first to

the most important practical needs of the farmer. His preliminary aim was to apply the results of technical investigation to practical farming conditions and so to improve the methods of cultivation. As a means to this end he began an intensive study of existing methods. The United States was divided into a number of farm management districts, and in each district a special investigator was to study the most successful farmers and to work for a general adoption of methods recognized to be advantageous. The scientific publications of this early period are, therefore, not much more than descriptions of selected, well-managed, farms, which served as models. Between 1906 and 1911 a considerable number of such model farms were described by Spillman and his co-workers, often with the avowed intention of influencing the great mass of the farmers.

While the Government in Washington sought to gain more and more influence over the States and the experiment stations, it could not itself escape the influence of two educational institutions in the country. One of these was Cornell University in Ithaca, New York, with which the agricultural college and the experiment station of the State of New York are affiliated. Here as in Minnesota, farm management study originated in the department of plant production. Exhaustive investigation of fruit cultivation in two small districts of the State of New York may stand as the forerunners of that method, the introduction and development of which are the main achievements of the institution in Ithaca. These investigations were carried on by the so-called "survey" method which was soon further developed and widely used. The first great success of this method was attained in 1911. In that year there appeared Bulletin 295 containing the results of the Tompkins County survey undertaken in the years 1906-1908. This time not only one branch of farm management, as in the case of earlier investigations, but farm management as a whole was subjected to an exhaustive analysis in a small district. The director responsible for this work was G. F. Warren who had already undertaken the earlier fruit surveys.

The essential features of the survey method may be summed up as follows. While, in the case of the cost-

accounting method the number of farmers must be limited for obvious reasons, and usually to those above the average, the survey is extensive and includes, as far as possible, all the farms of a certain district. This aim makes use of bookkeeping records impracticable. There remains the method of the questionnaire or of personal visits to the farm. The survey usually follows the latter method. A uniform list of questions is drawn up, and the observers visit the farm in order to obtain from the farmer's own lips the original data. The reliability of these depends naturally on many conditions. The observers sent out must be equipped with knowledge of human psychology, ability, mental alertness, and a comprehensive knowledge of agriculture, if they are to bring back reliable data. The rank and file of the farmers must be intelligent enough to grasp the useful aim of such an investigation and to cooperate in it. An explanation ought, as far as possible, to precede the survey. A further insurance against incorrect results is investigation of as large a number of farms as possible. Among the farms covered by Warren's surveys there were naturally many where no books were kept. In these cases the information with regard to financial results of the farm had to be based on the recollections of the farmer. That serious errors might creep in is undeniable. On that account this method has been severely criticized. And yet the survey method has been generally recognized and has won for itself a place at least equal to that of the cost-accounting method. Spillman later made comparative calculations with regard to the validity of survey data. His studies led to the conclusion that "errors in the farmer's knowledge of the details of his business and of the work he does are in every way comparable to the departure from the true mean in field plot experimental work and they distribute themselves about the true values in approximately the same manner. The fact that the survey method of investigation gives data sufficient to permit the law of averages to eliminate plus errors by the occurrence of similar minus errors while plot experiments ordinarily do not do this appears to justify the statement that the survey method is a more reliable means of arriving at those

facts to which it is applicable than the field plot experimental method."

This method, introduced so successfully by Warren, was soon imitated and its use extended. In Washington it was eagerly adopted and in a few years typical agricultural districts all over the country had been subjected to as thorough a survey as Tompkins County, New York. The method underwent a process of clarification. Warren's survey still contained many elements that had nothing to do with farm management as it was understood at that time. It contained long sections on women as farmers, on age and education of farmers, on the size of families on farms, in short, on things that now are usually looked upon as sociological. The fact that these things were included in the Tompkins County Survey is an evidence of the strong interest manifested at that time in social conditions in the country which found official recognition in Roosevelt's Country Life Commission. Under the influence of Spillman, the surveys carried on with the cooperation of the Office of Farm Management in Washington were restricted to problems of farm management in the narrower sense of the word, i.e., to farm profits, investments, systems of farming, etc. One of the most important contributions of Spillman and his co-workers in the field of surveys is the study on farm management practice of Chester County, Pennsylvania, published in January, 1916. This study helped to bring into prominence various theoretical questions which have not yet been settled. One of these is the question as to the best measure of economic success of an agricultural enterprise. The great majority of American farms are family units. Hence arose the well-known conflict between capitalistic calculation of net profits and the determination of the labor income. Warren and Spillman decided in favor of the latter. The method of calculation is roughly as follows. The difference between gross income and total expenditures is diminished by the interest on the capital invested reckoned at a specified rate, and the resulting sum in dollars is the labor income. The value of the dwelling and of family living from the farm is not included in this amount. It will be realized immediately that this measure

of farm profits contains certain shortcomings the avoidance of which is the object of numerous recent investigations.

However, before discussing recent developments, we must consider another phase of the pioneer period of American agricultural economics. All of the above mentioned "Fathers" of our science were trained as technical agriculturists, and no one of them had an education along economic lines. It is a fortunate coincidence that, at the time at which the earliest work in the field of farm management was undertaken, political economy also began to extend to the economic conditions of agriculture an interest which had long been absorbed by the tremendous industrial and commercial development of the country. In 1892 and in 1896 the American Economic Association discussed at its meetings agrarian questions, doubtless under the influence of the immediately preceding period of depression. T. N. Carver is the outstanding figure in the field of political economy to take an early and active interest in agricultural economic problems. From 1902 on he taught political economy at Harvard University, and in 1911 his "Principles of Rural Economics" appeared, in which agriculture is considered chiefly from the economic and sociological standpoint, although the business side is not entirely neglected. Carver always limited himself to deductive research and did not engage in exhaustive investigation of details. Nevertheless, his influence on the development of agricultural economics was very great. Besides Carver, R. T. Ely, one of the founders of the American Economic Association, also was one of the influential scholars of the older generation. He was not active in the field of agricultural economics in the early days, and yet we have reason to believe that his influence is reflected in the personality of H. C. Taylor who has perhaps more right than any of those we have named to the title of father of agricultural economics. In touch from his youth with practical agriculture, he had also a thorough economic training. Like Ely he studied in Europe (London, Halle, and Berlin) and after 1901 taught in the School of Commerce of the University of Wisconsin. In the winter of 1902-3 he gave the first lecture course in agricultural economics. Soon afterwards

(1905) he published a text book of agricultural economics, the first in America that can lay claim to scientific value. This work is not "Betriebslehre" in the German sense of the term, but it contains the theoretical basis of such a science. Neither is it "Agrarpolitik" although it deals with branches of knowledge which have definite politico-economic affiliations. It contains in rough outline all that American agricultural economics comprises today: organization of the farm, the sale of agricultural products, conditions affecting prices, tenancy, the problem of the size of farms. lt was not long before the University of Wisconsin decided to establish a department of agricultural economics and farm management. In 1908 Taylor was officially transferred from the School of Commerce to the agricultural experiment station. About the same time the work in farm management was assigned to D. H. Otis. The University of Wisconsin soon became one of the chief nurseries of the young science, and a large percentage of the younger generation of agricultural economists grew up in the school of H. C. Taylor. Certain branches of the work received special care and emphasis. The importance of agricultural marketing was early recognized. Careful attention was paid to tenancy, cooperation; and rural sociology. We find the names of several other well-known research scholars on the teaching force of the University of Wisconsin. B. H. Hibbard and C. J. Galpin are especially to be mentioned, the former in connection with cooperation, tenancy, credit, and marketing, the latter with the social side of rural life.

Under the influence of the research activity which began to develop in Minnesota, Cornell, and Wisconsin, the American Economic Association renewed and increased its interest in agricultural matters, which in the nineties had only been touched occasionally. An important event of 1907 was the official recognition of agricultural economics as an independent science by the American Economic Association. A committee meeting was held, with T. N. Carver in the chair, at which the following questions were discussed: What is agricultural economics? What does it include? and What should be its place in the academic program?

Most of the speakers declared themselves in favor of the wider interpretation of the term agricultural economics such as it bears today. The representatives of farm management were, however, not consulted. It was a meeting of economists, and men like Warren and Spillman were not yet inclined to incorporate their young science in a more comprehensive scheme.

Soon afterwards the farm management teachers began to organize. Warren called a meeting of teachers of farm management at Ithaca (1908). Two years later there followed, chiefly as a result of Spillman's efforts, the founding of the American Farm Management Association. This took place at a meeting called by Spillman at the time of the Graduate School of Agriculture which was that year held at the Iowa State College at Ames, and at which a course in Agricultural Economics was given. Although this course was given by men like Taylor, Hibbard and Butterfield, as well as by Spillman, the newly founded association limited itself expressly to farm management and among the first committee members were Spillman, Otis and Warren.

If farm management lost at a later time the independent position which it had at first, and became more and more a part of agricultural economics, this clearly came to pass under the influence of the rapid development of some other branches of science which aroused public interest in ever-increasing measure. To these belongs, above all, agricultural marketing. The first roots of the development of this subject go far back. Even in the seventies the powerful organization of the Grange recognized the importance of the marketing problem and made practical efforts to improve the situation. Later the Government also turned its attention to this field. The U. S. Industrial Commission, which undertook in 1900 a thorough investigation of the economic conditions of the country, acquired a clear understanding of the necessity for a scientific analysis of the marketing problem. The American Economic Association discussed the same question at a meeting in 1908. From this time on a strong public interest in these questions has been manifested.

The University of Illinois had very early (1901) turned its attention to the marketing conditions of agricultural products in the Chicago markets. However, these studies were limited in the main to the technical side of marketing. After 1913 the economic problems were mainly handled in Minnesota and Wisconsin. H. C. Taylor was also a pioneer in the field of agricultural marketing. Two different types of study may be clearly distinguished during that early period. One part of the work was devoted to the investigation and description of the passage of certain agricultural products from their sale by the farmer to their reception by the consumer. The second type of study was that of cooperative organization and its efficiency.

Meanwhile the Department of Agriculture in Washington had eagerly seized upon the new field of knowledge. Since 1909 various articles had appeared in the Agricultural Yearbook dealing with marketing and cooperation. These articles are of an explanatory nature. They attempt to make clear to the great body of farmers the importance of marketing, which is described as "the other half of agriculture." The study of these questions was taken up more extensively by the Office of Markets[2] established in 1913. C. J. Brand, Chief of the Office of Markets from 1913 to 1919, included within the scope of the work of his office, cooperative buying and selling, marketing business practice, methods and costs of marketing, standardization, markets in large cities and the retail trade, transportation and storage, marketing by parcel post, marketing livestock and meats, marketing dairy products, marketing cotton. On the whole the publications in this field were limited to begin with to analyses of a descriptive and statistical kind.

In addition to State and Federal investigation of marketing problems, other scientific investigations were undertaken which had a more or less direct bearing on the subject. In the nature of things, the consumer was as much interested in the development of the marketing of agricultural products as the producer. And so, it is not strange,

[2] This new office like the Office of Farm Management was an outgrowth of the Bureau of Plant Industry which had been occupied for some time with standardization and allied problems.

that the officials of large consuming centers, like New York, undertook exhaustive studies of existing conditions. Private organizations also, such as the American Academy of Political and Social Science or the National Conference on Marketing and Farm Credits did not remain inactive. Congress repeatedly took an active interest in the question, and created a commission to study agricultural credit and cooperation. This Commission sent representatives to Europe to study these questions on the spot.

Marketing and the subjects allied to it, such as co-operation, credit, transportation, etc., were not, however, alone in giving an impetus to the development of agricultural economics as a science. Since about 1900 the branch of science which is generally known to-day as rural sociology has pursued a path parallel to that of marketing. It is remarkable at what an early stage the close connection between economics and sociological questions was realized in the United States. Although rural sociology has never been so closely related to agricultural economics as marketing, which is generally recognized to be an integral part of agricultural economics, yet it must be admitted that the contact which existed between the two sciences from the beginning has grown closer with the passing of the years. In the early days of its development two men, in particular, played the rôle of pioneers in the field of rural sociology. One of them, T. N. Carver, has already been mentioned in connection with his influence on agricultural economics from the economic standpoint. His "Principles" contains a chapter on the "problem of rural social life" which outlines the essential points of the rural sociology of to-day. The second person of influence was K. L. Butterfield whose "Chapters in Rural Progress" published in 1908 can be cited as the first great treatise on the subject. The constructive mind of this man recognized very early the importance of agricultural economics as a whole, and even in 1913 he evolved a plan for a college course which outlined essentially the whole field of present day agricultural economics. At the time of the establishment of the Farm Management Association in 1910 Butterfield laid before the

meeting a concise scheme of classification[3] of the whole science of agriculture, which met with general approval and which played an important rôle for some time afterwards. More recently Butterfield's book "The Farmer and the New Day" has been much discussed, and has been effective in paving the way for the study of rural sociology. Moreover, Butterfield's influence is greater in the field of organization than in that of pure science.

In this connection, President Roosevelt's Country Life Commission, to which we have already referred, should not be forgotten. Among its members were authorities like L. H. Bailey, Henry Wallace, and K. L. Butterfield. The investigations undertaken by this Commission in 1908 dealt with rural economic and social evils, and the report of the Commission, accompanied by a special message from the President undoubtedly had a very stimulating effect on public opinion and indirectly on science. Another name must be mentioned in connection with this country-life movement. Sir Horace Plunkett, the great promoter of the cooperative movement in Ireland, had spent several years in America and was in touch with Roosevelt. His propagandist zeal contributed largely to the speedy recognition and development of sociological research.

Real intensive research in the field of rural sociology began shortly before the outbreak of the World War. Again it was H. C. Taylor whose far-sightedness recognized the possibility and the importance of intensive rural sociological studies, and who turned his attention in this direction without delay. He soon found a man who responded to his stimulation with the greatest willingness and energy, and who laid the foundation stone of the science of rural sociology in the modern sense of the term. This man was C. J. Galpin. His teaching activity in this new field began in 1911 at the University of Wisconsin. At the same time he started exhaustive inductive studies of rural social conditions in certain districts of the State

---

[3] Butterfield distinguished in agriculture:

1. The technical aspect: "Farm Practice" or "Agriculture."
2. The business aspect: "Farm Administration" or "Farm Management."
3. The scientific aspect: "Agricultural Science."
4. The industrial aspect: "Agricultural Economics."
5. The community aspect: "Rural Sociology."

of New York. His first publications appeared in 1914 and 1915. These fell on such well-prepared ground that in the following years a large number of agricultural colleges made eager use of the research activity in the new field. Soon there appeared the first textbooks (Gillette, 1916; Vogt, 1917; Galpin, 1918). Various research workers turned from general to rural sociology, and thus emancipated themselves from the mother science, just as the agricultural economists had done with regard to political economy in general.

The more seriously scientific research was undertaken in all the newly developed fields named above, including farm management, the more clearly was their relationship recognized. The logical development was, therefore, a coming together of the separate groups and the final union found expression in the formation of the Farm Economic Association and the creation of the Bureau of Agricultural Economics. In addition to the Farm Management Association which early attained a strong position and which was essentially the work of Spillman, various other organizations had grown up with special interests. In 1913 a National Conference on Marketing and Farm Credits was held, an outgrowth of which was the National Association of Agricultural Economists, founded in 1916. H. C. Taylor, meanwhile had come into closer relationship with the farm management group. He had always been on good terms with Spillman and his relations with G. F. Warren developed from rivalry to friendly cooperation. Taylor took occasion to make a practical study of farm management problems on his own farm and this undoubtedly increased the already existing tendency to a rapprôchement between him and the farm management group. At the same time the circle round Warren and Spillman had learned of the economists, and in 1917 the first attempts were made to unite in one organization the agricultural economists in the narrower sense of the term and the representatives of farm management. In 1919 this union was actually accomplished and the Farm Management Association became the Farm Economic Association. The Association had at that time 350 members and it began in June, 1919, a quarterly journal of

which the importance and scientific standing have since then become increasingly greater.

A similar tendency to the union of related, though hitherto separated fields of research, may be noticed in Washington. It will be remembered that in 1905, an Office of Farm Management was created in the Bureau of Plant Industry. Later (1915) it became an independent "office" immediately under the Secretary of Agriculture. It has already been mentioned that in 1913 an Office of Markets was established. It grew quickly, and in 1917 attained the higher rank of "Bureau of Markets." Further there had existed for many years a Division of Statistics, which after a reorganization in 1914 was given the name of "Bureau of Crop Estimates." Later, the process of uniting the three bureaus went forward with rapid strides. First the Bureau of Markets and the Bureau of Crop Estimates were united. In the following year (1922) the Office of Farm Management and Farm Economics was combined with the Bureau of Markets and the Bureau of Crop Estimates to form the Bureau of Agricultural Economics. H. C. Taylor was entrusted with the direction and the organization of this Bureau. The Bureau, as organized by Taylor, contained the following divisions. In numbers it is one of the strongest bureaus of the Federal Government.

A—Production Divisions

1. Farm Management and Costs
2. Crop and Livestock Estimates

B—Marketing Divisions

1. Cotton
2. Fruit and Vegetables
3. Livestock, Meats, and Wool
4. Administration of Center Market (Washington)
5. Grain
6. Dairy and Poultry Products
7. Cold Storage
8. Hay, Feed and Seed
9. Warehousing

C—General Divisions

1. Agricultural Finance (Credit, Taxation, Insurance)
2. Statistical and Historical Research
3. Agricultural Cooperation

4. Rural Sociology
5. Library
6. Land Economics
7. Information

Naturally all the divisions of the Bureau are not engaged in scientific research. Many of them are devoted to administration or to the various well-organized information services (acreage and size of crops, livestock situation, marketing reports). Nevertheless, this Bureau may be characterized as predominantly scientific. More than that, the Bureau of Agricultural Economics became the intellectual center of all agricultural economic research. Its leadership has been recognized by all State institutions as well as by private research agencies interested in the subject. It its impossible to mention here all the fields in which the Bureau is active. We shall only take up a few that are unusual or unknown in Germany.

The term "land economics" must first be made clear, as there is no German equivalent for it. "Nationalökonomie des Bodens" would be a half-way-usable translation. It means a branch of science which studies the economic nature and all the economic conditions of the land in the broadest sense of the word. "Land economics" oversteps the limits of agricultural economics inasmuch as it deals with land not used for agriculture, for example, with land speculation in cities and problems related thereto. On the other hand, it embraces land utilization, land taxation, land tenure, land settlement and land reclamation. The demarcation of this branch of science was only made in recent years and its main representatives, who also created the term "land economics" are R. T. Ely and L. C. Gray. The latter took over to the Bureau of Agricultural Economics the Division of Land Economics, created in 1919.

Rural Sociology also found official recognition and a permanent home in Washington. C. J. Galpin was put in charge of this work, and later he induced the Census Bureau to collect and publish information with regard to the size and composition of the rural population and its sociological structure. Thus sociological research was for the first time placed on a firm foundation.

The study of cooperative organization has very recently received a strong impetus. The legislation of 1926 provided abundant means for this special object, and, in a few years, the Bureau of Agricultural Economics will have become a first-class research, information, and advisory body in regard to Cooperation.

The older branches of science have also undergone sweeping changes. Farm Management, by copious use of the survey and cost-of-production methods, which frequently became stereotyped, had developed in breadth rather than in depth. A description of the "how" of existing circumstances had hitherto been regarded as more or less sufficient. Now a step forward was taken. An attempt was made to investigate the causal connection between farm organization and successful farming, in a word, to probe deeper into the structure of the economic side of farming.

The post-war agricultural crisis to which, in the last analysis, the greatly increased interest in agricultural economic questions may be traced, led to an intensive study of the problem of agricultural prices. There were statisticians and mathematicians who worked on these questions, and their influence on the research methods of American agricultural economics soon began to be felt. Particularly since a young investigator, Mordecai Ezekiel, pointed out new simplified methods of handling linear and curvilinear correlation has agricultural economics been characterized by a definite predilection for improved statistical methods, so that to-day a thorough mathematical and statistical training is a necessary requisite for the investigator in this field. A formal correlation mania in the beginning was followed by a more peaceful judgment of matters as they are, and to-day the necessary limits of statistical analysis are understood. And yet, the fact remains that those methods have been generally adopted and that they represent a characteristic feature of American research of to-day. Their application, moreover, is by no means limited to research in price trends where they originated; they have penetrated to the field of farm management and to other branches of agricultural economics.

The history of the development of American agricultural

economics would be incomplete without a reference to the legislative help and encouragement which it received. It is not necessary to recount the various measures which provided for the organization and the financing of the agricultural colleges and experiment stations, since they did not have any specific influence on agricultural economic research. However, the Purnell Act of 1925 is in a different category. It expressly emphasized the importance of increased agricultural economic research. In the interpretation of the provisions of the law, therefore, full recognition has been given to the economic aspects of agriculture. No less than half of the large sum at the disposal of the Purnell fund[4] is used for research work in agricultural economics. It is no wonder that as a result, this science, so modest in its beginnings, has undergone a tremendous development in recent years. A few figures will throw light on this development. The objection may be made that research activity, being purely intellectual, is incapable of quantitative conception. Nevertheless, the American custom of separating the research problems for future solution into organized projects gives us a means of tracing the growth of the work in agricultural economics by means of figures.

NUMBER OF PROJECTS IN THE EXPERIMENT STATIONS

	1919	*1922-23*	*1925-26*
Farm Management and Cost-of-production studies	73	102	190
Land Economics	12	24	46
Marketing and Cooperation	15	35	128
Rural Sociology	2	19	43
Various	..	5	22
	102	185	429

With this we approach the present. There remains for us the task of describing the present-day conditions as accurately as possible, avoiding details of local interest. From what has already been said, we see clearly enough that agricultural economic research today is carried on by

[4] The first sum granted by the Purnell Act was fixed at $20,000 for each of the 48 agricultural experiment stations. This sum is increased by $10,000 each year until the maximum of $60,000 is reached in 1929-30. These amounts represent an increase of earlier appropriations made by the Federal Government and supplemented by the States, amounting in the richer States to hundreds of thousands of dollars.

a system, the central pillar of which is the Bureau of Agricultural Economics at Washington and the supporting pillars of which are the departments of Agricultural Economics in the Agricultural Colleges of the States. While two decades ago only three institutions in the whole country had anything like farm management departments, to-day there are chairs of agricultural economics in practically all the States. A few colleges still prefer the term "farm management," but most prefer "agricultural economics" or "rural economics" as more comprehensive. Occasionally a dividing line is drawn, and two departments are created, the one for farm management, and the other for the remaining economic branches of agriculture. The scientific personnel of these institutions varies in number and in composition. Cornell (Ithaca, New York), has the largest faculty with 34 workers of academic rank. Other State colleges with a large staff are those of California, Illinois, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Ohio, Texas, Wisconsin. The three oldest schools of agricultural economics, Cornell, Minnesota, and Wisconsin, have maintained their good reputation. But various younger institutions have made a successful appearance on the scene, just as the pioneer generation of investigators has been followed by the younger generation, already numerous, who, with characteristic American activity and unerring clearsightedness, labor for the further development of the science.

The spirit of unselfish, impartial collaboration, which seems to be the rule among American scientists, is fostered and reduced to a system by the Government in Washington. The scientific direction is, as we have already said, in the hands of the young, but exceedingly active, Bureau of Agricultural Economics, and quite often the officials of this Bureau work in close personal and local touch with the State colleges and experiment stations. The direction of the scientific cooperation between the State institutions is in the hands of the Office of Experiment Stations, also in Washington. This Office has consultative and supervising functions. It sees to it that only suitable investigations and such as promise to be successful are undertaken, and

that only the best methods are used. It also tries to prevent as far as possible duplication of work. By the publication of the "Experiment Station Record" it brings about an exchange of experimental and research results such as can be found nowhere else in agricultural literature.

Although the degree of scientific collaboration is astonishingly high, at least to the German mind, efforts are being constantly made to bring about a further simplification of research. On several occasions committees have held meetings to study pertinent problems. It is even proposed to form a standing committee to act as a sort of clearing house and form a permanent link between all the places that have to do with agricultural economic research. More than that, an effort is being made to further and to develop collaboration between economic institutions and institutions with other interests, such as has already been successfully carried on in many places. It is undoubtedly a good idea, for example, to have the tractor problem handled at the same time by the department of farm machinery and the economics department of a college. Another example is a project in the marketing of milk, in which the divisions of dairying and of agricultural economics collaborate equally. The last link in the long chain of scientific collaboration is the living contact with extension work, which, it is true, is more seldom than in Germany directly performed by the research personnel, but which is recognized all the more willingly by the representatives of the science as the goal of their work.

Although from a purely statistical standpoint, the research work is for the most part in the hands of the State experiment stations and of the Bureau of Agricultural Economics in Washington, it should not be forgotten that a number of other bodies are active in our field. There is no doubt that these, too, the majority of them private organizations, will enter into the general scheme of collaboration. The quite large sum of at least $100,000 which, as is estimated by experts, is devoted every year by these bodies to research, seems small compared with the million and a half given by the Federal Government and the separate States for agricultural economic research. However, most

of the unofficial institutions are young and still in the period of development, and it may be that in the future private means will be given to a greater extent than has been the case up to now.

Of the non-State universities only a few have achieved any importance in the field of agricultural economics. We have already stated that T. N. Carver of Harvard University was an early exponent of our subject. Later the world-famous "Index of General Business Conditions" reports of this institution influenced the development of agricultural economics, at least indirectly. For several years the agricultural outlook reports of the Bureau of Agricultural Economics in Washington have provided for the agritultural interests what the Harvard reports do for the general economic situation. It is interesting to note that quite recently one of the most capable members of the younger generation of agricultural economists, J. D. Black, has been called from Minnesota to Harvard. That indicates that we may still expect great things in the future from that famous research center. Another private university that does agricultural economic work is Northwestern University in Chicago. It is now the home of the Institue for Research in Land Economics and Public Utilities, founded in 1920 at the University of Wisconsin. R. T. Ely is the Director. G. S. Wehrwein devotes himself especially to agricultural questions. The Institute deals with what in America is known as land economics. I have already tried to point out the scope of this branch of science. H. C. Taylor has also been an active member of this institute since he left the Bureau of Agricultural Economics in 1925. Another institution which makes contributions to our science, is Leland Stanford University in California. It harbors a Food Research Institute that divides its activity between technical production and marketing problems and economic questions.

While I am speaking of universities, I should like to call attention to the agricultural economic subjects chosen as theses for doctors' and masters' degrees. Their number, small to begin with, has recently increased very much. Considering the uniformly high quality of the American theses

for the doctorate it is suggestive that a report of this year[5] counts 70 on economic subjects. In addition, there were 106 theses for the master's degree. It is of interest to observe the distribution of these studies among the separate branches of agricultural economics.

NUMBER OF THESES FOR ADVANCE DEGREES, BY BRANCHES

	Doctor's Degree	*Master's Degree*
Farm management and cost-of-production studies	19	36
Land economics	17	9
Marketing and cooperation	27	40
Rural sociology	1	7
Various	6	14
	70	106

These figures include the theses presented at State universities.

The number of institutions for economic research that are independent, i.e., that have no teaching activity, has steadily increased since the war. Few, however, devote themselves to agricultural economic research to the same extent as the Institute of Economics. This institute is situated in Washington and its most important investigator in the field of agricultural economics is E. G. Nourse. The scientific viewpoint of the Institute would have to be termed in German phraseology "agrarpolitisch," that is to say, that private economic problems are secondary to national and international considerations in agriculture. The National Bureau of Economic Research in New York is chiefly concerned with the actual question of the national income and its distribution among the economic groups. The National Industrial Conference Board caused a sensation in 1926 by making an investigation of the present condition of agriculture. Still other bodies that make casual agricultural economic investigations could be mentioned or that at least supply source material for investigations. Among these are commercial firms that maintain their own economic staff, banks, economic services, and the like. Certain bodies with a cultural political bias do sociological research work. In this connection the Institute of Social and Reli-

[5] JOURNAL OF FARM ECONOMICS, v. 9, no. 3. July, 1927.

gious Research (New York) and the Scripps Institute for Research in Population Problems deserve special mention.

After skimming the surface, so to speak, of American agricultural economics, in conclusion we shall once more look into the depths and try to estimate the quality of the work done. A characteristic of American research activity is respect for the accomplished fact and a predilection for its expression by means of figures. The American cannot easily be surpassed in untiring accumulation of data and in their skillful, clear presentation. That is shown particularly in the surveys and cost of production studies of the earlier days which often carried too far the zeal for descriptive statistical material, and neglected the solution of the question of causes. This fault has more recently been clearly recognized. Specialization is demanded to-day. Too-inclusive studies are not desired. Deeper knowledge is sought after, though inductive methods are not neglected. On the contrary they have been gradually improved and refined until they attained a degree of complication which is hardly known in Europe. By treading the paths of "exact economic research"[6] the American scholars have reached a remarkably high standing through the introduction of statistical analysis. Both insight into the organization of the individual enterprise and a knowledge of the connection between agriculture and the economic life of the nation are essentially increased by the new method.

The American, on the other hand, does little deductive work. There is not one of the agricultural economic works that can be compared in any way with Aereboe's "Betriebslehre." That is no depreciation of analogous American works. It only calls attention to the difference in the intellectual attitude; on the German side an intuitive grasp of truth and never-failing sense for systematic arrangement; on the American side a collection of constructive details, all keenly observed and well described, which, nevertheless, does not present a very convincing picture. The German observer of American work is, therefore, more impressed by the detailed studies of an analytical nature than

[6] The German term is "exakte Wirtschaftsforschung" which has been introduced by Richard Ehrenberg (Rostock), the late editor of the "Thünen-Archiv." (Archiv für exakte Wirtschaftsforschung).

by the handbooks and textbooks of which there are many. The latter have a too pronounced didactic character—at least to the German taste—and that may bias the judgment, perhaps unjustly, against the American works.

Another characteristic feature of American research is the constant willingness to make studies which are of immediate practical use. There is a desire to give to the farmer, the produce merchant, the cooperative society, etc., direct practical guidance. These formulas are not taken out of the air, but they are based on scientific data. Typical of this, for example, is the attempt to establish a standard crop rotation for farms of a size that is most common in certain districts. The scientist feels his responsibility to furnish the practical farmer in as short a time as possible with all the knowledge which may help him to make an economic advance. The countless data which the research student gains from observation of actual practice are sifted, interpreted, and systematized, and then put back into practice again. In this process a very important connecting link is the extension service. In the case of cost-of-production studies, for example, the procedure is as follows: after an analysis has been made of the data, each interested farmer receives a statement in which the average accounts of the most successful farmers, those of the unsuccessful group and the results on the individual farm are compared. There can be no doubt of the educational value of such a measure.

It has already been pointed out that in addition to farm management a number of branches have developed which are considered as a part of agricultural economics. The most important of these are marketing, cooperation, land economics, and rural sociology. They are all young and are being specially emphasized at present. Another branch is agricultural geography, the chief representative of which is O. E. Baker. North America lends itself to geographical investigations. It is easily divided into large territories with like natural and economic conditions, and the wealth of statistical material collected by the Government, projected on the map by means of excellent graphic methods, offers a prolific source for the study of agricultural geo-

graphic conditions. In close connection with this branch we find American agricultural history, which is also based in part on statistics, and which belongs to the most interesting and instructive chapters of economic history. It seems surprising, at first, that the American, who, according to European ideas, is only interested in practical present day life, should have exhibited an appreciation of history and tradition. It is true that a thorough understanding of the culture tradition of the old world is not generally found. But the American scholar turns the more joyfully to the historical events which have taken place on his own continent. And, since American history has always been closely interwoven with the economic development of the country, it is not surprising that particular attention has been paid to the development of agriculture, as the strongest economic group. An excellent, comprehensive work on the history of agriculture of the Northern States bears witness to the deep scientific earnestness of the American agricultural historian. Interest in studies of this kind has been so strong and active that it was possible to form an agricultural historical association which publishes its own journal.

While the younger branches of our science were growing, the older ones such as farm management were experiencing considerable alterations. Changed and improved methods were being applied. Even the subject and the aim of the investigations are in process of change. H. C. Taylor has portrayed this change by comparing the older studies with the medical students' study of anatomy and by comparing the newer studies with the diagnosis of pathological conditions and the prescribing of remedies. In other words it might be said that in the branches of science of which we have spoken there is a transition from the static to the dynamic point of view. A few examples may be given. The agricultural surplus in America is one of the chief problems of American political economy. It is not surprising that this question is being continually brought up by scientists. In direct contrast to Germany one hears everywhere talk of artificial restriction of production, and the most varied methods are suggested to improve existing

conditions. Many suggestions and proposals are naturally purely political. The problem, as viewed in the light of farm management research, is the adjustment of production to existing conditions. It is particularly desirable to know to what extent the individual farmer can successfully adjust himself to price conditions by a change in his plan of crop cultivation or by a change of organization in the livestock enterprise. The practical farmer lends a willing ear to explanations and proposals along this line. He even occasionally takes a step in advance of the scientist and points out the way to research. Again and again we see wonderful collaboration between the practical farmer and the man of science. Both are eagerly interested when there is something to be learned. The tension which makes its appearance from time to time between these groups in Germany, and which is due to a certain kind of intellectual pride on the part of both of them is practically unknown in the new world. That is indeed one of the most important reasons for the gratifying development of agricultural economics in America.

STATE INDEXES OF PRICES OF FARM PRODUCTS[1]

ALBERT G. BLACK AND DOROTHEA D. KITTREDGE

MINNESOTA AGRICULTURAL EXPERIMENT STATION

Index numbers of prices of farm products for at least sixteen States have been constructed within the last five years. The agricultural economists in these States have found that general index numbers of farm prices do not describe conditions in their own States with sufficient accuracy. In fact, general index numbers, except by accident, never describe conditions anywhere with much accuracy. An index number, for example, which includes the price of both wheat and cotton does not fit either the cotton-growing area or the wheat-growing area much better than it does the dairy area or the Corn Belt. The purpose of this article is to discuss the problems that have been suggested by the efforts to construct these State index series and indexes of prices of farm products in general, and to present the method of handling them which has been followed at Minnesota.

The discussion may well begin by describing briefly the methods of constructing farm price indexes already in use. Four of the types most generally used, were outlined some three years ago by L. H. Bean and O. C. Stine.[2] These were all of the aggregative type, and were expressed as follows:

$$\text{Type A} \quad \frac{\Sigma P_1 Q_a}{\Sigma P_0 Q_a}$$

$$\text{Type B} \quad \frac{\Sigma P_1 Q_a}{\Sigma P_{cm} Q_a}$$

$$\text{Type C} \quad \frac{\Sigma P_1 Q_{cm}}{\Sigma P_0 Q_{cm}}$$

$$\text{Type D} \quad \frac{\Sigma P_1 Q_{cm}}{\Sigma P_{cm} Q_{cm}}$$

---

[1] Published with the approval of the Director as Paper No. 735, of the Journal Series of the Minnesota Agricultural Experiment Station.

[2] L. H. Bean and O. C. Stine, *Four Types of Index Number of Farm Prices*, Journal of the American Statistical Association, March, 1924. P. 30 ff.

The terminology used in these formulas was:

P_1 = Price given month,
P_0 = Average base price (e.g., average of 60 monthly averages),
P_{cm} = Average price for corresponding months in base period,
Q_a = Quantity per annum,
Q_{cm} = Average quantity for corresponding months in base period.

Since the discussion of the index numbers constructed for various States will refer to these types or modifications of them, a statement of the differences between these formulas, the purposes for which each is especially adapted, and the limitations of each, will be summarized at this point.

In Type A the monthly price of each commodity is weighted by an annual quantity of the commodity sold in some year, although not necessarily in the base year for prices. Thus, this type of index "measures the fluctuations in value of a fixed imaginary cargo consisting of specified quantities." It "fails to represent accurately the farmers' national wagonload which varies both in quantity and contents from month to month."

An index of Type B differs from Type A in that base prices for corresponding months ($P_{c.m.}$) are used instead of the average of monthly prices over the entire base period (P_0). This eliminates from an index of Type B whatever seasonal variation in prices obtained during the base period. The weighting is the same as Type A, and it therefore shares the same limitations due to fixed annual weights.

Type C is constructed by using an average of monthly prices over the entire base period, as in Type A, but it is "weighted by monthly sales instead of sales per annum." This index is, therefore, "a measure of fluctuations in the value not of an 'imaginary' annual wagonload, but of a load 'normal' for each month." The quantities actually marketed in a given month will not, however, agree with normal monthly weights. This is especially true in agriculture where marketings vary from year to year with early and late seasons, price fluctuations, crop failures, or abundant crops. When situations of this kind appear, this type fails to measure accurately the real situation.

Type D differs from Type C in that base prices for corresponding months are used instead of the average of monthly prices over the entire base period, thus eliminating seasonal fluctuations. Since the weighting is the same as Type C, it suffers the same limitations as Type C whenever actual monthly marketings differ from so-called "normal" marketings.

The index of farm prices of the Bureau of Agricultural Economics is constructed by Type A formula.[3] The base price for each commodity is an average for the period August, 1909 to July, 1914. The weightings are average quantities marketed from 1918 to 1923. This index therefore does not make allowance for seasonal variations in price during the base period, and does not provide weights which vary from month to month either according to a concept of normal or according to actual marketings of products. It measures fluctuations in monthly price according to a fixed annual cargo.

Two types of index numbers have been constructed to show the trend of prices of Missouri farm products.[4] The first of these index numbers, which has been selected as *the* Missouri number, involves: the current monthly price of each commodity; the average price of each commodity for the 60 months included in the base period of five years from January, 1910 to December, 1914; and a constant weighting for each month equivalent to one-twelfth of the average yearly amount of each product marketed in the five year period 1920 to 1924.[5] The price factors in this index number are the same as those included in Types A and C of the Bean-and-Stine formulas. The weightings, however, are essentially the same as in Type A since in the Missouri

[3] Monthly Supplement of Crops and Markets. U. S. D. A. August, 1924.

[4] Missouri Farm Prices and Purchasing Power, by Donald R. G. Cowan. Univ. of Mo., Coll. of Agr., Agr. Exp. Sta. Res. Bull. 84.

[5] The formula of this type may be expressed in the terminology of this article as follows:

$$\frac{\sum(p_1 q_x)}{\sum(p_0 q_x)}$$

when P_1 = given monthly price.
P_0 = average monthly price for the 60 months 1910–1914 inclusive.
Q_x = fixed monthly weight, (1/12 the average annual marketings 1920–1924).
x is used to designate some period other than "base" or "given."

index the assumption is made that the same amount of each commodity is marketed in each successive month. Type C of the Bean-and-Stine formulas makes allowance, by the use of a different quantity weighting for each corresponding calendar month, for the fact that the commodities in the farmers' wagonload undergo a monthly change in amount, which is not accomplished by the use of an arbitrary one-twelfth assigned to each month in this index of Missouri farm prices.

The second of the index numbers constructed by Missouri involves: the current monthly price of each commodity; the average price for each of the five corresponding calendar months included in the base period from 1910 to 1914, i.e. an average price for the five Januarys, the five Februarys, etc.; and weights for each of the twelve calendar months in proportion to the normal amount of each product marketed.[6] This index number is Type D, outlined by Bean and Stine for the purpose of taking into account, through the system of weights, the changes from month to month in the normal wagonload; and also for the purpose of eliminating seasonal variation in prices through the use of the average price for each calendar month in the base period, rather than an average price over the entire sixty months of the base period.

The index number of New York farm prices is also an aggregative type. It involves the given monthly price in relation to an average price for corresponding months in the base period 1910-1914, so that the seasonal price variation which obtained in the base period is eliminated. The quantities used for weighting in this number "approximately represent 1919, but vary from this if the yield of that year was abnormal."[7] The formula would therefore

---

[6] The formula of this type may be expressed in the terminology of this article as follows:

$$\frac{\sum P_1 Q_{cm(x)}}{\sum P_{cm(0)} Q_{cm(x)}}$$

when P_1 = given monthly price,

$P_{cm(0)}$ = average price for the corresponding month during base period from 1910 to 1914.

Q_{cm} = normal amount marketed in corresponding month.

x is used to designate some period other than "base" or "given."

[7] Farm Economics, New York State College of Agriculture, November 20, 1923, No. 9, p. 75.

appear to be practically the same as Type B of Bean and Stine.[8]

The index number of prices of Iowa farm products is of the weighted geometric type.[9] Although the yearly and monthly index numbers are computed along similar lines, the discussion here applies particularly to the monthly type. This index involves the price relatives of ten commodities, which show the relation of the current monthly price to the price in the five-year period of 1910-1914. A set of weights was worked out for each month of the year based upon the proportions of the gross income of Iowa farmers which each commodity yielded in the various months during the five-year period, 1920-1924.[10]

In addition to the States already mentioned, Connecticut, Vermont, Pennsylvania, Ohio, South Dakota, North Dakota, Utah, Oregon, Kentucky, Georgia, Alabama, Texas, and possibly others have computed price indexes of farm products. Those of Missouri, Iowa, New York, and the Bureau of Agricultural Economics, however, seem to illustrate the chief methods of computation, and to show the questions which arise in the making of farm price index numbers, which may be briefly summarized as follows:

(1) Is the given monthly price to be related to the average price of all the months in the base period, or to the average price of only the corresponding calendar months of the base period? Some States have chosen one

---

[8] The formula of this type may be expressed as follows:

$$\frac{\sum P_1 Q_z}{\sum P_{cm(0)} Q_z}$$

where P_1 = given monthly price.

$P_{cm(0)}$ = average price for corresponding month during base period.

Q_z = annual quantity in 1919.

[9] Index number of Iowa Farm Products Prices, by Knute Bjorka. June 1926, Current Economic Series Report No. 3, Agricultural Experiment Station, Iowa State College of Agriculture and Mechanic Arts.

[10] The formula of this type may be expressed in the terminology of this article as follows:

$$\sum p_z Q_z \Big/ \sqrt{\left(\frac{P_1}{P_0}\right)^{P_z Q_z} \times \left(\frac{P_1'}{P_0'}\right)^{P_z' Q_z'} \times \left(\frac{P_1''}{P_0''}\right)^{P_z'' Q_z''} \quad \ldots}$$

when P_1 = given monthly price

P_0 = price in base period

$P_z Q_z$ = weighting for each commodity expressed as a percentage of the gross income, 1920–1924.

method and some another. The answer to this question seems to lie in the purpose desired of the index number, unless the price index is to be used with a corresponding quantity index to meet the factor reversal test, in which case further consideration is necessary to make certain that the test is met. If it is desirable to eliminate from the index number the seasonal price fluctuations which prevailed in the base period, then the price index may be months of the base period ($P_{c.m.}$). If this is not desired based on the average price of the corresponding calendar and the factor reversal test is not a consideration the index may be based on the average monthly price prevailing over the entire base period, (P_0).

(2) Is the monthly weighting to be a fixed annual quantity, or a monthly quantity "normal" to each calendar month, or some system of weighting which will represent actual conditions rather than some concept of "normal," which may not be "normal" at all for a specific year? The normal monthly weights, such as are included in formulas of Types C and D seem to weight prices more nearly according to the real situation than do the fixed annual weights of Types A and B. However, neither method of weighting seems entirely satisfactory. Although all the methods used by the sixteen States enumerated above have not been ascertained in detail, we are not aware of any attempt to bring into the weighting of a price index the influence of the monthly amounts sold, as they vary from year to year due to crop failures, bumper crops, shifts in production, retarded or advanced seasons, and the like. Using average amounts sold within any base period, or any concept of normal monthly marketings, is likely to throw an erroneous weighting upon price in those months when the actual marketings vary widely from the amounts represented in "normal" or base period weightings.

(3) Is it possible to establish a relationship between the price index number and the index of income? Several States as well as the Bureau of Agricultural Economics have worked both on price indexes and on income, but no effort has apparently been made to tie the two together, and make the index of gross income dependent upon the index

of prices and the index of quantities sold. Since cash incomes are the result of quantities sold and prices received, it seems desirable to find indexes of prices and quantities which will be consistent with an index of cash income.

Desirable Improvements

The queries raised under (2) and (3) have seemed to suggest the lines of improvement most needed in the construction of farm price indexes. Due to the peculiarities of agricultural production, many formulas used in calculating other price indexes do not yield satisfactory results when used in constructing indexes of prices of agricultural products. A price index for agricultural products is in danger of being unduly influenced by bumper crops or by crop failures. For example, if constant normal weights are used, a bumper crop, which results in a reduced price per unit, cannot be given the influence in the index number that its importance demands. The resulting price index will show a price reduction smaller than the actual decrease. Similarly a crop failure causes the price index to reflect a rise in prices which is unwarranted. The high price when constant weights are used is weighted by a larger quantity than that actually sold.

For illustrative purposes let us assume that there are only two commodity prices entering into our index number.[11] The prices of each in the base period are $.50 per unit and the quantities marketed are 1,000 units. In the given period the price of commodity A increases to $1.00, the price of commodity B remaining the same. If constant weights are used the price index will rise to 150. In the case of agricultural products where demand is almost unchanged over a period, variations in price are due largely to fluctuations of supply. There is a normal inverse re-

---

[11] Throughout this illustration the aggregative index with constant weighting is assumed. It is expressed symbolically as

$$\frac{\sum p_1 q_0}{\sum p_0 q_0}$$

when

p_1 = price in given period
p_0 = price in base period
q_0 = quantity in base period

lationship between price and amount sold.[12] In the above case this normal inverse relationship is ignored because it is assumed that the same quantity of commodity A was exchanged when the price rose to $1.00 as when the price was at $.50. Obviously this is an erroneous assumption because the price of commodity A could not have increased 100 per cent if the quantity sold had remained constant.

An index number is supposed to be representative of the price level. The prices entering into the index must be weighted according to their importance, if it is to fulfill the purpose for which it is intended. The only means of judging the importance of a price is by the amount of the commodity sold at that price. Therefore if the quantities of products actually sold are not given consideration in an index, the resulting average must be incorrect because some prices will influence the average more than they should and others less than they should.

In the hypothetical case discussed above the higher price of commodity A must necessarily have been accompanied by a smaller quantity sold. This being the case, the weighting of the high price by the constant quantity results in an unwarranted increase of the index because the price is given a weighting not justified by the quantity of the commodity sold.

The change in wheat production in Minnesota offers a case in point. In 1913 the production was 68 million bushels and in 1926 it was 29 million bushels. Clearly wheat was not as important in 1926 as in 1913. To weight its price by constant weights taken, let us say, in 1913 would give the wheat price an importance in the index which it does not deserve.

Neither does a constant "normal" monthly percentage of the crop sold furnish a reliable weighting for prices within the year. In the case of potatoes, for example, different years show different tendencies on the part of farmers in marketing their crops. By January 1, 1917, the growers of Minnesota potatoes had sold 38 per cent of their crop, and on January 1 of the following year, only 20

[12] Russell C. Engberg, *Industrial Prosperity and the Farmer*, Appendix B pp. 279 ff.

per cent.[13] The monthly marketings of many agricultural products vary from year to year with the experience and circumstances of the previous season, the size of the crop, the current price, the price expected later in the year, and the judgment of farmers in general. In addition to these factors, retarded and advanced seasons also cause variations in the monthly quantities sold in different years.

If the investigation of price fluctuations centers around mere price changes without regard to the importance of the prices involved, there can be no objection to the use of constant weighting, or for that matter equal weighting. But if the object is to prepare an index which is to take account of the importance of specific prices making up the price level, constant weighting does not serve the purpose.

In many fields of industrial production, the quantities produced vary gradually over a period. Hence price indexes with constant weights satisfactorily serve the purpose for which they were intended. Only after a period of years has elapsed will it be found that the weights adopted at the beginning distort the index materially. Compilers of constant-weighted indexes, such as the Bureau of Labor Statistics, recognize the gradual distortion of these indexes which arises from the application of constant weights to prices which in the latter part of the period are related to quantities materially different from the weights used. Consequently we find them changing the weights from time to time to correct for the cumulative errors due to obsolete weighting.

For agricultural price indexes, however, constant weights should be avoided because of the extreme fluctuation in crop production from year to year. To neglect these fluctuations is to neglect the purpose of weighting.

The second suggested improvement may be achieved by constructing an index of prices which can be directly related to an index of cash incomes. Heretofore the problem of tracing the course of farm incomes has been unrelated to the problem of changes in the price level. The usual approach has been to construct an index of prices and to calculate incomes separately. The close relationship exist-

[13] U. S. D. A., Yearbook 1922, p. 674.

ing between prices and incomes appears never to have received the attention its importance demands.

Cash incomes are composed of the sum of the products of prices of commodities and the quantities sold. An index of incomes, therefore, is the ratio between the income at one period and the income at the base period. This relationship is the familiar value ratio and is expressed symbolically as

$$\frac{\sum p_1 q_1}{\sum p_0 q_0}$$

If prices multiplied by quantities equal incomes, the price index times the quantity index should equal the value ratio or the index of incomes. By selecting an index number formula which fulfills this requirement, the relationship of incomes, prices and quantities may be readily established.

The Minnesota Formula

The Minnesota formula was selected with a view to incorporating both of the changes discussed in the preceding section . It may be expressed as follows:

$$\sqrt{\frac{\sum[P_1 Q_{cm(0)}]}{\sum[P_{cm(0)} Q_{cm(0)}]} \times \frac{\sum[P_1 Q_{cm(1)}]}{\sum[P_{cm(0)} Q_{cm(1)}]}}$$

where P_1 = given monthly price

$P_{cm(0)}$ = average price for corresponding month of base period 1924–25–26

$Q_{cm(0)}$ = average amount sold for corresponding month of base period 1924–26

$Q_{cm(1)}$ = amount sold in given month.

This formula, it will be apparent, is a modification of Fisher's so-called "Ideal" formula, his No. 353. Fisher's expression of this formula is

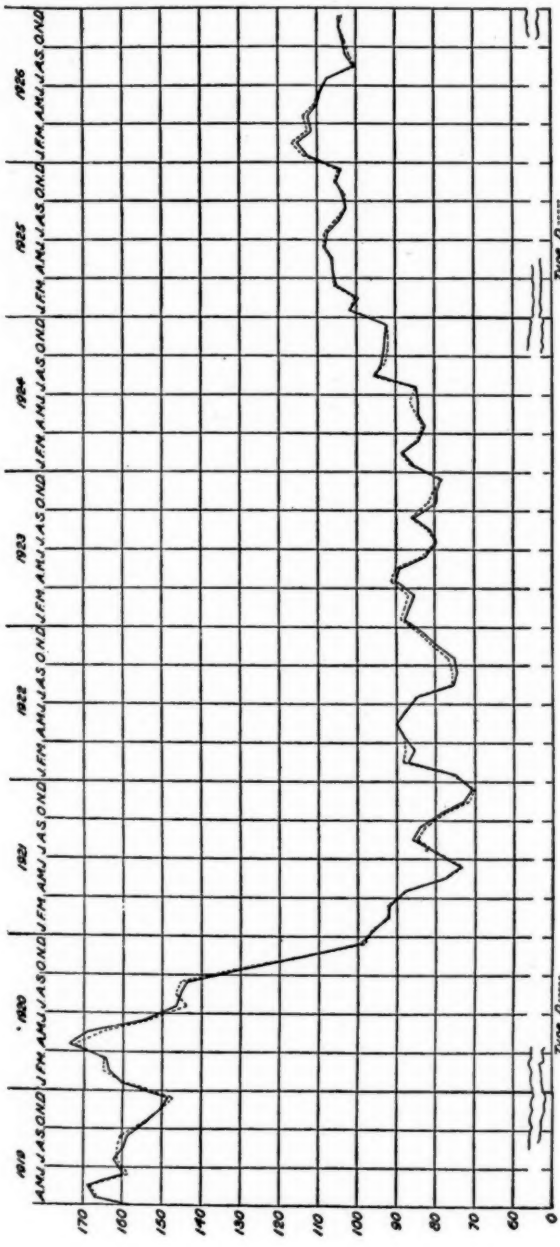
$$\sqrt{\frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times \frac{\sum P_1 Q_1}{\sum P_0 Q_1}}$$

As used for the Minnesota index, the base is broadened to 3 years, and the formula is expanded into a monthly index

based on corresponding months, which eliminates the seasonal fluctuations of the base period.

The principal objection to the use of a formula of the Fisher type is the difficulty and additional labor of securing current quantities with which to weight. The work of compiling a price index without doubt is increased materially when the quantities sold in each given period are incorporated. However, when an index of income is a consideration, quantities sold currently are absolutely essential, so that these additional data are available for a price index if desired. The prices and quantities which enter into the calculation of incomes, and thus of the value ratio, are the same as those used in constructing a price index number of this type—or vice versa. Although the work of ascertaining given-period quantities is somewhat difficult, it is by no means an impossible task, especially in recent years when data are recorded more completely than in earlier years. There is, however, an unavoidable delay in securing these current quantities. Prices may be secured promptly, but the quantity sold at the price will not be available for some time, so that a final index of price by this formula cannot be computed for some time after the close of the current month. It will be observed, however, that the first half of the Minnesota formula is the Type D index described by Bean and Stine. This can be computed currently. No serious objection can be raised to using this formula as a preliminary index until the current quantities are available, when the final index will be constructed. We have found that the two correspond closely throughout the seventeen years for which the index has been prepared. The chart shows for 8 years, 1919-1926, the indexes for Minnesota farm prices when constructed by Type D formula above and by the Minnesota formula, called Type F.

Some economists object to the introduction of current quantities into a price index number. They probably would not object to a quantity weighing which was an average of the quantity marketed in the base period and that marketed in the given period. Some highly desirable index



Comparsion of index numbers of Minnesota farm products constructed according to the Type D formula and the Minnesota formula Type F, 1919 to 1926.

MONTHLY INDEXES OF PRICES, AND QUANTITIES SOLD, OF MINNESOTA FARM PRODUCTS, AND GROSS CASH INCOME OF MINNESOTA FARMERS, 1910-1927

(Average of corresponding months of 1924-1925-1926 = 100)

	Price	*Quantity*	*Gross Cash Income*		*Price*	*Quantity*	*Gross Cash Income*
1910				*1915*			
Average	75.7	58.0	43.9	Average	74.2	71.7	53.2
January	75.1	59.5	44.7	January	80.3	70.5	56.6
February	75.5	61.7	46.6	February	79.3	62.9	49.9
March	78.6	59.4	46.7	March	75.7	59.6	45.1
April	79.6	48.7	38.8	April	78.1	57.5	44.9
May	73.2	53.4	39.1	May	80.7	68.9	55.6
June	75.0	53.7	40.3	June	77.0	63.4	48.8
July	73.4	51.4	37.7	July	74.3	61.2	45.6
August	76.0	61.1	46.4	August	72.5	51.2	37.1
September	81.7	65.2	53.3	September	71.2	71.2	50.7
October	77.6	59.3	46.0	October	68.6	83.5	57.3
November	73.2	57.9	42.4	November	70.4	100.3	70.6
December	68.9	59.1	40.7	December	70.2	98.1	68.9
1911				*1916*			
Average	69.6	54.7	38.1	Average	89.9	67.0	60.2
January	70.3	56.5	39.7	January	78.1	67.5	52.7
February	70.1	49.5	34.7	February	83.8	76.7	64.3
March	66.7	53.7	35.8	March	86.5	77.2	66.8
April	65.7	51.1	33.6	April	88.5	71.2	63.0
May	64.0	59.7	38.2	May	86.3	77.4	66.8
June	62.8	60.6	38.1	June	83.6	75.1	62.8
July	63.4	56.3	35.7	July	81.4	74.6	60.7
August	72.2	46.7	33.7	August	87.3	54.2	47.3
September	77.7	54.4	42.2	September	99.4	57.6	57.3
October	75.2	53.9	40.5	October	100.3	58.9	59.1
November	72.2	61.6	44.5	November	101.5	69.5	70.5
December	69.7	54.4	37.9	December	96.9	56.4	54.7
1912				*1917*			
Average	70.9	60.6	43.0	Average	133.8	60.9	81.5
January	75.6	52.9	40.0	January	107.3	50.0	53.7
February	76.3	55.0	42.0	February	120.8	47.4	57.2
March	78.2	55.4	43.3	March	126.7	55.0	69.7
April	81.8	48.9	40.0	April	140.0	56.9	79.7
May	80.1	54.2	43.4	May	137.5	60.2	82.8
June	74.5	52.9	39.4	June	131.0	56.2	73.6
July	69.9	46.9	32.8	July	124.0	48.1	59.6
August	67.8	60.9	41.3	August	135.1	59.5	80.4
September	67.3	65.5	44.1	September	144.0	67.4	97.1
October	64.5	72.6	46.8	October	144.9	74.3	107.6
November	65.2	78.7	51.3	November	139.0	81.1	112.7
December	63.9	73.6	47.0	December	141.2	62.6	88.4
1913				*1918*			
Average	70.3	68.6	48.2	Average	146.9	81.1	119.2
January	66.4	66.7	44.3	January	149.2	69.4	103.6
February	69.9	64.1	44.8	February	153.2	68.3	104.6
March	71.0	66.2	47.0	March	147.9	75.8	112.1
April	75.2	58.9	44.3	April	145.4	70.4	102.3
May	73.0	61.4	44.8	May	144.0	77.2	111.2
June	71.7	65.0	46.6	June	139.9	74.9	104.8
July	70.2	57.4	40.3	July	139.3	63.7	88.7
August	68.9	65.9	45.4	August	141.4	94.3	133.3
September	71.2	85.5	60.9	September	154.7	94.1	145.5
October	68.6	74.2	50.9	October	148.7	95.0	141.3
November	70.9	75.3	53.4	November	147.1	80.8	118.8
December	68.6	73.5	50.4	December	147.7	95.5	141.0
1914				*1919*			
Average	73.6	66.3	48.8	Average	155.9	74.2	115.7
January	72.1	68.9	49.7	January	153.6	68.9	105.8
February	73.6	68.6	50.4	February	144.6	70.7	102.3
March	71.9	69.5	50.0	March	150.1	83.1	124.7
April	72.3	61.0	44.1	April	166.8	78.2	130.4
May	74.8	60.6	45.3	May	168.8	84.4	142.4
June	72.2	62.9	45.4	June	159.7	82.2	131.3
July	72.5	58.9	42.7	July	162.1	77.1	124.9
August	74.3	61.6	45.8	August	159.8	75.0	119.9
September	79.2	71.5	56.6	September	158.7	70.1	111.2
October	73.4	69.2	50.8	October	153.7	69.0	106.1
November	73.9	69.0	51.0	November	150.2	69.3	104.1
December	72.4	67.7	49.0	December	148.3	68.3	101.3

	Price	Quantity	Gross Cash Income
1920			
Average	144.9	69.2	100.8
January	160.4	72.5	116.8
February	163.5	66.5	108.7
March	164.4	68.1	111.9
April	173.4	64.0	110.9
May	169.2	74.8	126.5
June	155.0	75.9	117.7
July	146.3	72.5	106.0
August	145.2	62.3	90.4
September	143.6	68.2	98.0
October	128.1	72.6	93.0
November	112.9	74.3	83.9
December	99.4	60.0	59.6
1921			
Average	82.3	73.6	60.6
January	95.9	72.8	69.8
February	92.2	68.5	63.2
March	91.8	69.0	63.3
April	87.5	65.1	57.0
May	78.0	80.8	63.0
June	73.4	92.1	67.6
July	80.0	74.0	59.2
August	85.8	82.8	71.0
September	83.9	73.5	61.7
October	78.6	79.8	62.7
November	72.4	68.6	49.7
December	70.5	61.6	43.4
1922			
Average	81.6	83.1	67.8
January	75.0	74.1	55.6
February	86.8	74.5	64.7
March	85.3	77.4	66.1
April	88.1	70.6	62.2
May	90.1	88.8	80.0
June	87.9	96.4	84.7
July	84.4	87.4	73.8
August	75.4	87.1	65.7
September	74.3	81.2	60.4
October	75.2	80.9	60.9
November	79.4	85.1	67.6
December	82.5	88.8	73.3
1923			
Average	83.6	90.7	75.8
January	87.8	103.9	91.2
February	87.5	82.7	72.4
March	85.1	90.0	76.6
April	90.0	86.2	77.6
May	89.0	92.4	82.2
June	82.2	90.9	74.7
July	79.7	85.8	68.4
August	81.0	94.1	76.3
September	85.4	91.9	78.5
October	79.7	87.6	69.8
November	79.6	94.0	74.9
December	78.3	87.5	68.5
1924			
Average	88.7	101.9	90.4
January	85.5	90.9	77.7
February	88.2	103.7	91.5
March	84.0	95.8	80.5
April	82.4	96.1	79.2
May	84.3	94.1	79.3
June	84.2	93.0	78.3
July	84.8	100.6	85.3
August	95.2	93.9	89.4
September	93.6	111.9	104.8
October	93.0	119.8	111.4
November	91.9	107.8	99.0
December	92.3	103.6	95.6
1925			
Average	104.3	100.2	104.5
January	101.6	110.1	111.9
February	99.5	97.0	96.5
March	105.0	96.4	101.2
April	105.9	98.4	104.2
May	106.1	98.7	104.7
June	108.1	101.0	109.2
July	107.3	94.9	101.8
August	104.5	113.3	118.4
September	102.7	104.8	107.6
October	103.6	89.2	92.4
November	105.1	95.8	100.7
December	104.0	103.2	107.3
1926			
Average	107.6	97.7	105.1
January	112.6	97.9	110.2
February	115.2	97.1	111.9
March	111.4	106.2	118.3
April	112.4	103.9	116.8
May	110.1	105.9	116.6
June	109.5	103.5	113.3
July	107.4	104.4	112.1
August	100.5	91.8	92.3
September	102.8	85.1	87.5
October	103.5	93.2	96.5
November	104.4	95.9	100.1
December	104.3	93.3	97.3
1927[1]			
January	111.1	....	....
February	113.0	....	....
March	108.4	....	....
April	110.1	....	....
May	108.9	....	....
June	100.6	....	....
July	98.2	....	....
August	100.3	....	....
September	99.8	....	....
October	97.9	....	....
November	96.5	....	....
December	95.6	....	....

[1] Price index numbers for 1927 are preliminary

numbers have such a weighting,[14] which may be expressed as $Q_0 + Q_1/2$. The weighting we have adopted is in essence a geometric mean of the base and given period quantities and is almost the same as the arithmetic mean of the two. Our weighting takes account of decided changes in quantity between the base period and the given period, and thus

[14] For example Formula 2153, Fisher, *Making of Index Numbers*, p. 484.

gives a more accurate picture of the real changes in the price level than is possible when constant weights are used.

The Minnesota index meets both the time reversal and the factor reversal tests which Professor Fisher proposes as the criterion of index number accuracy. Because it does meet the factor reversal tests, it can be used directly in calculating an index income. When it is multiplied by an index of quantities calculated from the same formula, the product equals the value ratio. It has been pointed out above that the value ratio is the desired index of income. The calculation of the quantity index involves little additional work, as the factors necessary have already been obtained for the price index.[15]

The index series of Minnesota farm prices, of quantities of products marketed, and of gross cash income are as shown in the table on pages 324 and 325.

These series show that prices of Minnesota farm products exhibit much the same tendencies found in price changes for the country as a whole. Apparently Minnesota farm prices were lowest during 1911. There was a gradual increase up to the year 1915. The years 1916, 1917, and 1918 were marked by sharp increases in prices. Prices during 1919 averaged the highest for any year in the series. They continued to increase during the early months of 1920 and reached the peak in April. Thereafter prices fell some 74 points by the end of the year. The decline continued throughout 1921, the low point being reached in December when the index was 70.5. Prices continued low during 1922, and although there was some recovery from the December, 1921 figure the average of 1922 was slightly below that of 1921. The year 1923 witnessed a slight recovery, which became more rapid during 1924 and continued through 1925 and a part of 1926. The index during the latter part of 1926 was slightly below that of the early months. Prices for 1927 on the whole have been above the base period normal, but during June, July, August, and

[15] The index of quantities is

$$\sqrt{\frac{\sum[Q_1 P_{cm(0)}]}{\sum[Q_{cm(0)} P_{cm(0)}]} \times \frac{\sum[Q_1 P_{cm(1)}]}{\sum[Q_{cm(0)} P_{cm(1)}]}}$$

September they declined to a point very close to normal. On the whole the price index has acted according to expectation.

The index of quantity of products sold, however, discloses a surprising trend in production. The sales during 1911 were the lowest for any year of the period. Thereafter, there was a rather steady rise in marketings with only slight recessions in 1914 and 1917. The quantity of marketings increased sharply in 1918, declined in 1919 and in 1920, and increased steadily thereafter. For the period as a whole there has been a decided upward trend in physical volume of production as indicated by farm marketings.

This increase which represents Minnesota conditions is no doubt greater than for the United States as a whole. Much of the increase in Minnesota has been due largely to the increase of livestock, livestock products, and corn. There have been either absolute decreases or only slight increases in production in several of the products which made up the bulk of farm production earlier in the period. Probably not many States have witnessed such rapid changes in the type of commodities produced. Hence the Minnesota production index reflects conditions not present in equal degree in many other sections of the country.

Heretofore the importance of quantity sales as a determinant of farm incomes has probably been underemphasized. The above indexes of prices and quantities show that, at least for Minnesota, the quantity of production has been exerting an increasing effect upon farm incomes. This is particularly true since the beginning of the post-war depression.

The third index series traces the course of the gross cash income of Minnesota farmers from 1910 to 1926. It is equal to the product of the price index of each period and the corresponding quantity index. Gross cash incomes were lowest in 1911. Thereafter there was a steady rise until 1916 and a sharp rise during 1917 and 1918. The peak was reached in 1918 when the index of gross cash income reached 119.2 as the average for the year. There was a decline in 1919 which appears to be due entirely to the lower average quantity of farm marketings during that

year. The price index continued to rise, but the quantity of sales declined sufficiently to cause a lower gross cash income. There was a reduction of income in 1920, and a further decline of 40 points in 1921, when the gross cash income reached the level of 1916. There was an improvement in 1922, which has continued to the present time.

Commodities Included, Sources of Data, and Base Period

Although the chief interest in the Minnesota index centers in the formula chosen and the purposes which it serves, it may be well to outline briefly the commodities used, the sources of price and quantity data, and the period selected as base.

The prices of sixteen products produced by the farmers of Minnesota are included in the Minnesota index. These commodities are corn, wheat, oats, rye, flaxseed, barley, hay, potatoes, hogs, beef cattle, calves, sheep and lambs, butterfat, milk, eggs, and chickens. Sales of these products constitute the major part of the marketings of Minnesota farmers. No attempt was made to include truck crops or fruits. These are of minor importance and their prices and quantities are difficult to secure.

For the most part, data on prices and quantities of the above commodities were supplied by publications of the United States Department of Agriculture. In a few cases information secured from local sources was believed to serve the purpose better than that furnished by Federal publications. No attempt will be made to present the detailed methods used in constructing the index, nor the exact sources of data. This information will be included in a later publication.

All indexes of prices of farm products which we have had the opportunity to examine are based upon a pre-war period. If a pre-war base is selected, the latest year not affected by war conditions is 1913. Since that date there has been a tremendous economic upheaval. Conditions of production likewise have been seriously disturbed. New financial institutions have been established. Methods of distribution have been affected in certain lines by the development of co-operative marketing. In short, the

economic world of 1927 is vastly different from that of 1913. It is extremely difficult to look backward from the present and obtain any clearcut picture of conditions as they were fourteen years ago. Too many things have happened in the meantime. Since we are living and producing under post-war conditions, it is well to relegate the war and pre-war periods definitely to the past and select a base representative of present conditions.

Agricultural production is somewhat subject to variation beyond the control of those engaged in the industry. Conditions in a single year, therefore, may not be truly representative. Consequently a price index of agricultural products is a safer guide if it is based upon an average of a period of years rather than upon a single year. This is particularly true when the index is prepared for a single state. Local crop conditions may affect state production whereas conditions for the entire nation may be normal.

For recent years price and quantity data are much more satisfactory than for the pre-war period. We believed that it was more advisable to adopt a base period for which data were accurate and easily available and to build back from that base into the period when data were neither so authentic nor so plentiful, than to select a more distant base and to build forward from it. The latter choice could not have produced such reliable results. Because of the above considerations the base period selected for the Minnesota index was the average of corresponding months of the years 1924, 1925, and 1926.

Conclusion

The logical, fundamental principles embodied in an index computed by the Minnesota formula, rather than the minor numerical differences between this index and those computed by other formulas, seem to give it preference over other types. By assigning to prices a weighting which combines quantities sold in the base and given periods, the inaccuracy of constant weights is remedied and the price situation as experienced currently by farmers in marketing their products is more nearly represented. Although an index of the Minnesota type requires a considerable amount

of calculation, no data are required which are not necessary in a computation of farmers' income, which is the foundation point in such a study. Relative statements of farmers' income from one period to another furnish the criterion from which the estimates of price and quantity changes, as expressed in index numbers, may be judged. An index number of prices multiplied by the corresponding index number of quantities should equal this fundamental relationship of incomes. The type of formula chosen for the Minnesota index fulfills this requirement, which is not met by types in common use. Furthermore, such consistent indexes of prices and quantity, calculated by the Minnesota formulas, provide the factors which make up the changes of farmers' income, so that for Minnesota we are now in a position not only to state the joint effect of these factors but also to examine the separate contributions of prices and quantities.

COOPERATIVE MARKETING OF GRAIN IN THE UNITED STATES AND CANADA

J. F. Booth
Bureau of Agricultural Economics

Twenty-five years ago grain producers in the United States and Canada had reached about the same stage of progress in the solution of their marketing problems. In both countries experiments were being conducted with local cooperative elevators. Since that time, however, there has been a pronounced difference in the developments that have taken place. In Canada, the independent local cooperative elevator has been superseded by a group of large farmer-owned associations that link local and terminal elevators with central selling agencies. In this country, on the contrary, producers have continued to rely mainly upon the local farmers' elevator for improvements in grain marketing. Attempts have been made to extend cooperative activities beyond the local station but these have not met with the success accorded similar efforts in Canada.

In this article the situation here and in Canada will be reviewed with the thought of bringing out the fundamental differences and, if possible, of throwing some light on the present trends in cooperative grain marketing. The experiences of the farmers of the United States will be dealt with first, but major emphasis will be placed on Canadian activities.

Experiences in the United States

Farmers' Elevator Primarily an Assembling Agency

The farmers elevator in the United States is an independent local unit and is operated in competition with more than 4,000 similar elevators owned by farmers, and with thousands of other elevators operated by private interests. The prices received by producers for their grain are those determined by the forces centering upon the grain markets of the world and, in this price-making process, farmers are represented by these numerous small elevators which are unrelated for bargaining purposes. As a merchandising

agency, the farmers' elevator lacks volume enough to make it effective. Its primary function is to assemble grain and forward it to market.

This situation has caused much dissatisfaction and has resulted in several attempts to organize grain farmers into larger marketing units. There are many, of course, who support our existing method of marketing and who contend that it is fair and equitable. They discount the contention that the producer is at a disadvantage and, while they would probably admit that he has relatively little direct say in the determination of the price for which his product is to be sold, nevertheless they affirm that the supply side is adequately supported, albeit these forces are not consciously working in the interests of producers. Thus we have two conflicting points of view which tend to perpetuate the existing methods of marketing.

If farmers themselves were unanimous in believing that the sale of their grain through existing channels worked to their disadvantage, they would undoubtedly effect a change. They are not, however, and it is for that reason that the present network of marketing agencies, private and cooperative, exists. As previously stated, the attempts of producers to combine their forces into larger marketing agencies have, so far, failed to draw the support which their organizers expected. This does not mean, of course, that they have been entirely without results; quite the contrary is undoubtedly true. Nor does it mean that present efforts are doomed to failure, for there are at the present time indications that something really worth while may be achieved.

Different Forms of Organization

Three more or less distinct types of agency, other than local elevators, have been experimented with by grain producers. One of these is represented by the so-called "line elevator" association.[1] This is a combination of elevators under central ownership and control for the purpose of obtaining the advantages which might accrue through the

[1] The term "line elevator" originated with the practice of private companies acquiring elevators along particular lines of railway.

operation of larger units. The fact that cooperative elevators experience keen competition from privately owned line-elevator organizations has also stimulated interest in this form of organization. Some interest has also been shown in federations of local elevators, but little progress in this direction has been made.

The second is represented by cooperative commission agencies organized for the purpose of selling grain received from farmers' elevators. Some business is also done directly with farmers and some with independent elevators. No attempt is made by commission agencies to alter the rate of marketing by farmers.

The wheat pool is the third definite attempt of grain producers to extend their activity beyond the local elevator. In this case the object is to combine the grain of a large number of producers in a centralized association for the purpose of regulating its movement to market.

Cooperative Line-Elevator Associations

There have been only a few attempts by cooperatives to operate elevators on a line basis in the United States. The principal effort, that represented by the Equity Cooperative Exchange, has failed. That agency, with headquarters at St. Paul, Minnesota, acquired about 80 elevators in Minnesota and North Dakota on the line basis of operation. The company expanded rapidly during the war years. Credit was extended liberally on farm supplies, which were handled as side lines and, in 1920, with its credit drastically curtailed because of the after-war deflation, the company found itself in embarrassing circumstances. Added to this difficulty was the fact that many of the company's elevators were being operated in regions where grain production was giving way to a more diversified agriculture. Many of these elevators were being operated at a loss. Because of these and other difficulties, the company passed into the hands of receivers and its affairs are now being wound up.

Several other attempts at line elevator operation have been made on a small scale. Some of these combine elevators in a particular county, while others are made up of

elevators located around a certain central point.[2] None of these organizations, so far as is known, combine more than 10 or 12 local elevators. Several of these associations have failed, while a number of others have been fairly successful. At least two of these have been in operation for more than 15 years.

The possibilities of the line basis of operation are, unfortunately, being measured largely by the ill-fated experience of the Equity Cooperative Exchange. In spite of the fact that single failures in other lines of business do not seriously impede progress, there is a feeling on the part of many that the Equity's experience has demonstrated for all time that nothing is to be accomplished by combination of farmers' elevators into larger operating units.

Cooperative Terminal Commission Agencies

The second type of large-scale cooperative grain-marketing agency is that represented by cooperative terminal commission associations. The first of the associations now operating was formed in 1915, but most of them have been organized in recent years.

The cooperative commission company acts mainly as a sales agency in the terminal markets for farmers' elevators, although in at least one case business is solicited from farmers direct. There are eight of these associations now operating and, together with their branch offices, they are represented on 12 of our principal grain markets. The volume of grain handled by these agencies during 1927 amounted to 34,677,537 bushels.

The commission agencies, except in two cases, are members of organized boards of trade or grain exchanges. They function in much the same manner as private grain commission merchants. They handle grain for both farmers' elevators and independent elevators, and, to a smaller extent, for farmers direct. They charge the usual commissions authorized on the markets where they operate. They also buy grain for immediate resale. No attempt is made

[2] The Mitchell County Farmers' Union Cooperative Association, with headquarters at Beloit, Kansas, is representative of the county unit plan. The Farmers' Union Grain Company at Aberdeen, South Dakota, represents an association combining elevators located about a central point.

to hold grain for the purpose of stabilizing the market or for speculative purposes.

The capital stock of the cooperative commission agencies is owned for the most part by farmers' elevators, although in several cases capital has been obtained from farmers direct, or from general farmer organizations such as the Farmers' Union. The ownership of capital stock does not usually carry any obligations as to patronage, but most elevators that hold stock give their company a part or all of their business.

The cooperative commission agencies are extending their business gradually. Several organizations are experimenting with the operation of local elevators but they are doing so cautiously and as experience indicates that such a step is wise. If experience with country elevators proves profitable, it is probable that terminal facilities will also be acquired.

The Wheat Pool Movement in the United States

The third of these three types of large-scale grain marketing organizations is the wheat pool. Two factors were responsible for the formation of wheat pools in the United States. One of these was the ever-present complaint, already referred to, that grain farmers have little to say in the determination of prices for which their grain is sold; the other was the after-war deflation which brought in its train ruinously low prices for grain. It is true that the first wheat pool was projected before the break in prices in 1920, but the great stimulus came from the resulting agricultural depression.

The wheat pool represents an attempt to combine a large volume of grain in one organization and under conditions that will enable the management to control its movement to market. The producer is advanced approximately two-thirds of the market value of his grain at time of delivery and receives the balance in several additional payments as sales are made throughout the year. To insure stability, the producer is required to sign a contract agreeing to deliver his grain for a period of years, usually five. All producers who deliver the same grade of grain receive the same base price, irrespective of the time of delivery.

The theory behind the wheat pool is that which is back of all large business organizations—volume and control. This is expected to result in larger returns to producers by reducing costs and by stabilizing and increasing prices.

The first wheat pools were formed in Washington, Oregon and Idaho in 1920 and 1921. Altogether about 16 State or regional pools have been formed, but today only 8 associations are operating.

The wheat pools of the United States have confined their operations to the handling of wheat. Their combined volume during the past 5 years has ranged from 17,000,000 to 27,000,000 bushels depending upon the size of the crop. The benefits derived from their operations, however, cannot be judged from their size, for as a competitive cooperative agency they have undoubtedly had a stimulating effect on prices, more particularly in reducing the spread between local and terminal prices.

The pools have had many difficulties to contend with and have not achieved the measure of support that their sponsors had hoped for. A detailed discussion of these difficulties is beyond the scope of this article, but it seems desirable to mention several that are thought to be among the most important: (1) In the first place they represent a new idea in grain marketing which many farmers' elevator supporters felt would supplant their organizations or at least detract from their influence. (2) There was some tendency by pool organizers to under-estimate the accomplishments of farmers' elevators and the support accorded them. (3) There was lack of unanimity among pool organizers, which resulted in dissension in the ranks of pool supporters. (4) Because of the low price of wheat and the resulting agricultural depression, it was extremely difficult to obtain sufficient operating capital. (5) The fact that farmers must sell their oats, barley, flax and rye to their local elevator has caused many to continue selling their wheat to the local association. (6) On top of these difficulties came a rapidly declining market, beginning in 1920, which for three years made it extremely difficult for the group of pools organized at that time to return prices comparable with those received by farmers outside the pools

who sold in the early part of each season. The failure of these early pools made it extremely difficult for those organized later to acquire the support they might otherwise have obtained.

In spite of the difficulties encountered, the wheat pools continue to draw a large measure of support and are now entered upon their second stage of operation. Profiting by the experience of the last eight years, they are reshaping their methods of operation to some extent in an attempt to build up efficient marketing organizations.

Thus we find three types of activity in cooperative grain marketing, all directed toward greater service than is provided by the local farmers' elevator. The first and second have much in common. The line elevator organization begins in the country and aims at centralized selling together with economical operation of local facilities; the cooperative commission agency begins in the terminal market; establishes closer contacts with farmers' elevators, even to the point of leasing or purchasing such in order to insure volume. These agencies sell grain as it is delivered by farmers and do not attempt to influence price by holding the grain.

The wheat pools, although now acquiring county elevators, were organized primarily to act as sales agencies. Their objective has been to take control of the farmers' grain and to offer it for sale only as market conditions appeared to justify.

In spite of the development of large-scale grain marketing associations, wheat pools, commission agencies and line elevators, not more than 6 or 7 per cent of the wheat crop of the United States is handled by such agencies. The 4,000-odd independent local farmers' elevators remain the dominant agrarian activity in grain marketing and are handling, as local agencies, approximately 40 per cent of the grain marketed in the United States.

Canadian Experiences

Reference was made, earlier in this article, to the fact that Canadian grain producers of 25 years ago experimented with independent local elevators. These, however, did not operate for long. The grain business in Canada

at that time was dominated by a comparatively few large grain firms and milling companies with elevators which were operated on the line basis. The competition which they brought to bear on the isolated farmers' companies soon forced the latter out of business. To make matters worse, no friendly commission company came to the support of the farmers' companies as was the case about this time in the United States.

Satisfied, therefore, that the independent farmers' elevator was not the solution to their problem, Canadian farmers organized a cooperative commission company as the first step in a campaign that has since given them virtual control of grain marketing in Canada. By loading their grain into cars from side-tracks or loading-platforms and consigning to their own commission company, farmers were thus able to control the movement of their grain into consumptive and export channels.

In succeeding years this young farmers' company, the Grain Growers' Grain Co. (Ltd.), branched out and acquired both country and terminal elevators. Two additional companies, the Saskatchewan Cooperative Elevator Co. (Ltd.) and the Alberta Farmers' Cooperative Elevator Co. (Ltd.), were also formed. These were organized on the cooperative line basis and extended their operations into the terminal markets. In 1917, the Grain Growers' Grain Co. (Ltd.) and the Alberta Farmers' Cooperative Elevator Co. (Ltd.), joined forces under the name United Grain Growers (Ltd.). Thus, from 1917 on, the farmers of Western Canada were represented by two cooperative line elevator companies. In 1926, more than 60,000 farmers owned stock in these two organizations. Stock ownership represented an investment in the company as a whole and not in any particular local elevator. Local associations were formed about country elevators to act in an advisory capacity but the ownership and control of local elevators was vested in the central company and its management. In this way, farmers focused their attention upon grain marketing as a regional proposition and not as a local-elevator problem. The development of this point of view has had much to do with the success of more recent Canadian activities in grain marketing.

During succeeding years these two farmers' companies acquired 850 country elevators, and operated terminal elevators with a total capacity of 30,000,000 bushels. They obtained representation on the Winnipeg Grain Exchange, the Minneapolis Chamber of Commerce and the Chicago Board of Trade. They organized export subsidiaries to control the movement of grain to consuming countries. The volume of grain handled by these two companies is given in Table 1. The combined volume represents more than 20 per cent of the marketable Canadian grain crop.

TABLE 1.—GRAIN HANDLED AND PROFITS MADE BY THE UNITED GRAIN GROWERS (LTD.) AND THE SASKATCHEWAN COOPERATIVE ELEVATOR CO. (LTD.) SINCE 1918[1]

Year	*United Grain Growers (Ltd.)*		*Saskatchewan Coöperative Elevator Co. (Ltd.)*	
	Grain receipts Bushels	*Profits Dollars*	*Grain receipts[2] Bushels*	*Profits Dollars*
1918	29,879,672	441,760	25,994,000	124,811
1919	22,203,007	148,549	20,812,000	193,599
1920	24,503,237	463,675	19,512,000	224,988
1921	36,581,371	233,743	26,196,000	279,413
1922	31,545,776	118,350[3]	34,770,000	463,056
1923	32,944,668	532,171	40,773,000	442,212
1924	47,163,179	552,433	48,502,000	475,534
1925	30,855,532	418,574	27,893,000	377,872
1926	43,013,807	676,378	52,630,000	825,547
1927	41,000,000	720,266		

[1] The Saskatchewan Cooperative Elevator Company was acquired by the Saskatchewan Wheat Pool in 1926.
[2] Includes only grain handled by country elevator department. The commission department handled about the same quantities annually. The volume of the company's terminal elevators in late years was considerably larger.
[3] Loss.

The United Grain Growers diversified its business so as to include the handling of livestock and farm supplies. This company also engages in several other subsidiary activities. The Saskatchewan company, on the contrary, confined its operations to the handling of grain. In their grain-handling operations, both companies followed practices common to the trade. They bought grain or handled it on consignment. They handled grain for both shareholders and nonshareholders. No contracts were used. No attempt was made to change the movement of grain to market. Profits were returned to members mainly on the basis of stock dividends, although in recent years the United Grain Growers has been returning a portion of its earnings on a patronage basis. In short, these two companies built up their business on a basis of better service,

but with the same principles of operation as were employed by private competitors in the trade.

Cooperative Elevator Companies Accomplish Much

The Canadian cooperative elevator companies have been very successful, although, as will be brought out later, they have failed to accomplish all that farmers expected. Their earnings during a 10-year period, above the costs of doing business, are shown in Table 1. In every year but one during their existence, a substantial profit was shown. A loss was incurred by the United Grain Growers during the 1921-22 crop year but this was due to depreciation of the inventory value of machinery and farm supplies and not to a loss on its grain business.

Important as these data are as an indication of what can be done in grain marketing, the greatest benefits to Canadian farmers came from the competitive influence of their own companies upon local prices. Besides greatly improving the services offered, the cooperative companies materially reduced the spreads between local and terminal prices. In support of this contention, it should be observed that the Royal Commission appointed by the Dominion Government, in 1923, to study grain marketing conditions, reported that at certain of its hearings evidence had been submitted to the effect that the price committee of the Northwest Grain Dealers' Association, during certain periods of the year, sent out two price lists as bases for the purchase of grain by local elevator managers; one went to elevators at points where the Saskatchewan Cooperative Elevator Co. (Ltd.) was represented, the other to elevators at points where the farmers' company was not a competitor. The first list contained prices designed to meet the competition provided by the farmers' company.

The cost of handling grain during the 15 years of the Saskatchewan company's operations is shown in the accompanying chart. (Fig. 1.) The effect of volume on costs is clearly indicated. In certain years of partial crop failure, when the volume handled per elevator fell to slightly more than 60,000 bushels, the operating costs per bushel were aproximately twice as great as for years of good crops

when the volume exceeded 120,000 bushels per elevator. Incidentally, it may be observed that during years of low average volume some elevators were operated at a loss and some, because of absolute crop failure, were not operated at all. Had these elevators been independent units, many might have failed.

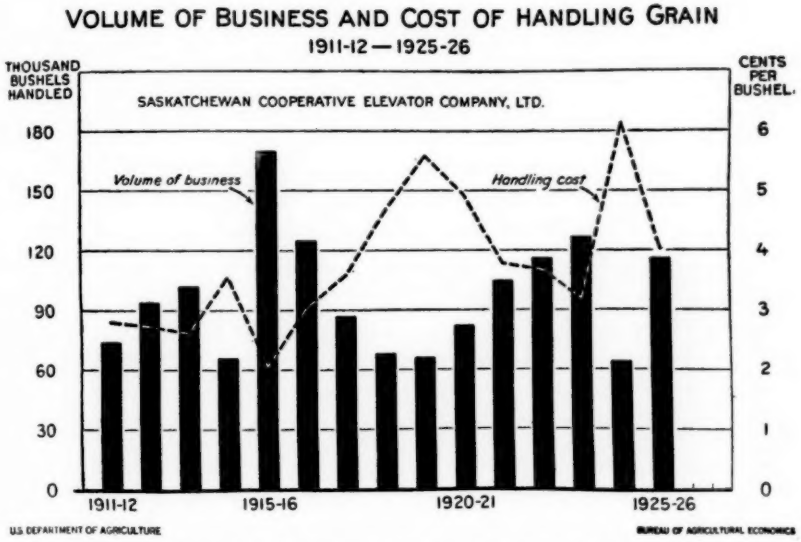


FIG. 1. That the per-bushel cost of handling grain is closely related to the volume of grain handled is indicated by the experience of the Saskatchewan Cooperative Elevator Company (Ltd.), during 15 years of operation.

Lack of volume due to light crops is only one of the various reasons which might have caused the failure of local elevators had they been operated as single units. As it was there were no failures. An elevator closed its doors or operated on small volume for a time but took its place among the profitable elevators a year or two later when the unfavorable conditions had perhaps shifted to other sections. As a whole, the company made large profits or savings, and the farmers of Saskatchewan continued to receive service from their local cooperative elevators where, under the system of individual unit operation, many might have failed.

Contrast this situation with that in the United States. We do not know how many farmers' elevators have failed

but information obtained by the United States Department of Agriculture indicates that many elevators have passed out of the farmers' hands, especially during the last five years.

Partial or complete crop failures were responsible for some elevator failures. Speculation and extension of credit on farm supplies were also causes, and, of course, there were still others. Some of these causes of failure could only be overcome by operation of the elevators on a cooperative line basis but many could be met by some degree of coordination under central supervision.

The other benefits derived from the operation of these companies are numerous, but difficult of adequate appraisal. They include: (1) The development among grain producers of a confidence in their ability to operate successfully large business enterprises; (2) encouragement of a point of view that regards the grain marketing problem as one embracing the industry as a whole and not as the problem of any local community; (3) assistance to western agriculture through support of favorable grain-trade legislation, freight rates, tariffs and taxation; and finally, (4), the training of a corps of agricultural leaders and trained executives capable of handling large business organizations and of representing farmers in matters of public concern.

For years, prior to the wheat pool movement, the cooperative elevator companies were the dominant influences in grain marketing in Canada.

The Canadian Wheat Pool Movement

Then came the wheat pool. Dissatisfied with the declining price of grain during 1920 and succeeding years, and realizing that their own companies had been powerless to avert the decline, farmers of Western Canada turned their attention to the pooling principle then being advocated in the United States and Australia. Sentiment in favor of pooling was encouraged by the operation of the Canada Wheat Board, a government-controlled agency that had handled the entire Canadian wheat crop of 1919. The Board's operations, which were virtually those of a compulsory pool, were highly satisfactory and farmers asked

that its operations be continued at least as a temporary peace-time measure. This was not to be, however, and as a last resort, farmer-sentiment (encouraged to a considerable extent by the presence of Aaron Sapiro) swung strongly to the pooling idea.

The thought behind the desire for a wheat pool was, of course, that by obtaining control of a large part of the crop, an agency of the pooling type could function in much the same manner as had the Wheat Board. By advancing only a portion of the market value at time of delivery by the producer, the association was protected against declining prices and could move its grain into consuming channels in a more orderly manner than was possible by the cooperative elevator companies. The latter, by reason of their bases of operation, were virtually required to sell grain or options as fast as farmers delivered, which meant sale of the bulk of the grain crop during a period of three months.[3]

Organization Set-up

The structural organizations of the Manitoba, Saskatchewan and Alberta pools are similar to one another and to the wheat pools of the United States. The member signs a 5-year contract to his provincial association agreeing to deliver all of his marketable wheat to the association. The provincial organization is made up of districts and sub-districts. Within the latter, again, are local associations. Members are represented by elected sub-district delegates who in turn elect the directors of the association annually. The local association is for educational and contact purposes but has no control over the management of local elevators.

The three provincial pools jointly organized a central selling agency which has headquarters in Winnipeg and branch offices in other Canadian cities, as well as in cities of the United States and Europe. This agency sells all of the grain delivered to the provincial pools. The Central Selling Agency is also selling grain for the Ontario Grain

[3] During each of the six years, 1917-1922, approximately 70 per cent of the wheat crop of Western Canada was marketed during the months of September, October and November.

Pool, an organization of farmers in the Province of Ontario. The Ontario pool began operations with the 1927 crop and is patterned after the western pools.

In the Provinces of Manitoba and Saskatchewan, pools for oats, barley, rye and flax (known as "coarse grains") have also been formed. A single contract covers all of these grains and the business is handled in every particular by the wheat pool organization and central selling agency.

The Alberta pool began operations in 1923 and the Saskatchewan and Manitoba organizations in 1924. In 1924, also, the Central Selling Agency was created. Approximately 140,000 farmers (Table 2), considerably more than

TABLE 2.—MEMBERSHIP OF THE CANADIAN WHEAT POOLS

Year	*Manitoba*	*Saskatchewan*	*Alberta*	*Total*
	Number	*Number*	*Number*	*Number*
1923	[1]	[1]	25,601	25,601
1924	9,216	51,268	30,711	91,195
1925	14,372	72,016	35,997	122,385
1926	17,234	80,418	38,460	136,112
1927	19,109	82,133	38,966	140,208

[1] The Manitoba and Saskatchewan pools began operations a year later than did the Alberta pool.

half of the farmers of these three Provinces, have signed contracts to deliver their grain to these organizations. The volume of grain marketed by the Central Selling Agency for the provincial pools is given in Table 3. The quantity of wheat handled during the last three years has amounted to more than 50 per cent of the Canadian crop annually.

TABLE 3.—VOLUME OF WHEAT AND COARSE GRAINS HANDLED BY THE CANADIAN POOLS, 1923-1926

(In thousand bushels—i.e., 000 omitted.)

Crop Year	*Wheat*			*Coarse Grains*[2]		
	Manitoba	*Saskatchewan*	*Alberta*	*Manitoba*	*Saskatchewan*	*Total*
1923[1]			35,250			35,250
1924	8,427	50,093	22,880			81,400
1925	12,488	129,708	45,167	13,790	11,364	212,517
1926	15,874	117,066	43,627	12,594	7,981	197,142
1927[3]						209,000

[1] The Alberta pool began operations in the fall of 1923, but the Saskatchewan and Manitoba pools did not commence until the fall of 1924.

[2] Coarse grain pools were organized in Saskatchewan and Manitoba during 1925 and are handled by the wheat pools of these Provinces. Grain included in these pools is also sold by the Central Selling Agency. No coarse grain pool exists in Alberta at the time of writing.

[3] Data incomplete.

Pools Acquire Elevators

During their first year's operations the pools depended upon the existing elevators to handle their grain, paying the prevailing rate for carload lots and a rate of from 4 to 6 cents per bushel on wagonload lots, or "street grain," as such lots are called in Canada, depending upon contract arrangements and grade of grain. However, the experience of the cooperative elevator companies had shown the advantages of elevator facilities, both country and terminal, and pool leaders wisely provided for the accumulation of the capital necessary to acquire these. This has been accomplished by deductions from the returns due to growers. Total deductions for elevator and commercial reserves, which in no year have exceeded 3½ cents per bushel, amounted to nearly $14,000,000 at the close of the 1926-27 crop year. (Table 4.) It is expected that deductions for the current year will increase this total to approximately $20,000,000. With this fund, over 900 country elevators and several large terminal elevators have been acquired. Another 200 local elevators and addi'ional terminal elevators are now being built or purchased. Capital for current operations has also been provided.

TABLE 4.—TOTAL DEDUCTIONS MADE FOR COMMERCIAL AND ELEVATOR RESERVES BY THE CANADIAN PROVINCIAL POOLS, 1923-1927, EXCLUSIVE OF SURPLUS CREATED FROM THE EARNINGS OF POOL ELEVATORS.[1]

Year	*Alberta*	*Manitoba*	*Saskatchewan*	*Total*
	Dollars	*Dollars*	*Dollars*	*Dollars*
1923-24[2]	211,581			211,581
1924-25	570,644	269,918	1,714,701	2,555,263
1925-26	968,704	415,456	3,501,382	4,885,542
1926-27	1,396,603	780,013	4,173,774	6,350,390
Total	3,147,532	1,465,387	9,389,857	14,002,776

[1] The contract with growers in each association provides for a maximum deduction of 2 cents per bushel on wheat, and proportionate amounts on other grains except in Manitoba, where a 2 cents flat rate applies on all grain. The amounts so retained are to be used to acquire elevators. A deduction of 1½ per cent of the gross selling price of all grain may be made by each association for the creation of a commercial reserve. The total reserves have also been increased by the retention of a part of the excess earnings of pool elevators.

[2] See footnote 1, Table 3.

Capital to finance the first advances to growers is provided to the extent necessary, in excess of the amount derived from early grain sales, by a group of large banks.

In 1926, the Saskatchewan pool purchased the facilities of the Saskatchewan Cooperative Elevator Co. (Ltd.) for $11,059,000. This deal involved terminals, office buildings and 451 country elevators.

Method of Operation

The Canadian pools, like those in the United States, make an advance at the time the grain is delivered by farmers. This advance, for the past four years, has been $1.00 per bushel, f.o.b. Fort William or Vancouver, which means about 85 cents per bushel net, on the average, to the farmer. Second and third payments have been made each year just prior to seeding and harvesting of the new crop and final payments at the close of the fiscal year. While there is a difference of viewpoint as to the merits of this plan of deferred payments, the consensus of opinion in Western Canada now favors it because it spreads the income over a period of 12 months rather than having it all in a lump sum.

Sales Methods

The Central Selling Agency is represented on the Winnipeg Grain Exchange and sells, roughly, 25 per cent of its grain there. The percentage was much higher during the first year of operation. The bulk of the grain now moves direct to domestic and export buyers. Branch sales offices are maintained in Toronto, Canada; London, England; and Paris, France. Shipping offices are also maintained at New York, Montreal and Vancouver. Agency connections have been established in most importing countries.

No arbitrary distribution of sales is attempted. Merchandizing, to Canadian pool officials, does not mean, as some have suggested, the selling of 1/12 of the crop or any stated quantity each month. The pool has materially retarded the movement of grain into consumptive channels, but is not committed to any preconceived plan of selling.

Costs of Operation

Maximum charges for the handling of grain in Canada are authorized by the Board of Grain Commissioners, but competitive conditions have sometimes prescribed lower

rates. The pool pays the customary rates to all agencies handling its grain. In the marketing of wagonload lots of grain, which represents roughly one-half of the crop, the pool pays to private or cooperative companies a rate which is comparable to the minimum margin formerly taken on this grain by elevator companies. Where elevators operated by the provincial pools have charged the same rates prescribed for private competitors, they have returned several million dollars to producers in excess earnings.[4] The lower cost of operating pool elevators has resulted from larger volume than competitors received.

The only additional cost introduced by the pool method is in overhead administration of the provincial pools. This cost has averaged less than one cent per bushel (Table 5) and is more than balanced by savings on elevator operations.

TABLE 5.—COST OF OPERATING THE CANADIAN PROVINCIAL POOLS AND THE CENTRAL SELLING AGENCY, 1923-24 to 1926-27[1]

Pool	Cost per bushel			
	1923-24[2]	1924-25	1925-26	1926-27
	Cents	Cents	Cents	Cents
Alberta	0.484	0.405	0.418	0.347
Manitoba		1.028	1.270	.803
Saskatchewan		.520	.380	.450
Central Selling Agency		.330	.200	.174

[1] Does not include local elevator, terminal, or transportation costs.
[2] The Alberta pool began operations in the fall of 1923 but the Saskatchewan and Manitoba pools did not commence until the fall of 1924.

Accomplishments of the Canadian Associations

Accomplishments of cooperative associations may be of several kinds. Obtaining better returns for producers by increasing prices or reducing costs is one. Another is to be found in the creation and operation of successful associations, although some may deny that this is an accomplishment unless it results in additional income to producers. Few, however, will doubt that it is a very real

[4] The surplus earnings of the Saskatchewan pool elevators for the crop year 1925-26 were $708,956 and for 1926-27, $1,375,000. Fewer elevators were operated by the Alberta pool, but surplus earnings were proportionately large. Manitoba local elevators are operated at cost, but producers share in the earnings of terminals operated by the central selling agency.

accomplishment to build up cooperative organizations such as the large associations in this country and in Canada. A third accomplishment is the result of certain indirect benefits which may be credited to the Canadian wheat pools as well as to their predecessors, the cooperative elevator companies. These arise from the efforts of these large associations in obtaining favorable freight rates, grain trade legislation, tariffs, and taxes. But more of this later.

There is a strong inclination to measure cooperation by the yardstick of price returns. Many believe that, in order to justify its existence, a cooperative association must return better prices to its members than are paid by competitors. The tendency, therefore, is to measure results with those paid by noncooperative agencies or with cooperative associations operating along different lines. This has been done extensively in both the United States and Canada.

Representatives of the organized grain trade in Canada have, during recent years, computed a simple average of the daily closing prices for cash wheat on the Winnipeg Grain Exchange. This theoretical average is advanced each year as the price which the Canadian pool should have paid its members. This assumption is the result of the propaganda used in many quarters that "orderly marketing" would insure to pool members the average price of the year. This computed average is also interpreted as the price received by nonpool farmers.

If nonpool grain were marketed in the same quantity day by day throughout the year, and in carload quantities, such a comparison as that advanced would have some merit. However, about 70 per cent of the Canadian crop is marketed during September, October and November. A fair comparison would, therefore, demand consideration of the quantities sold as well as the prices paid. Futhermore, one-half of the Canadian wheat crop, pool and nonpool alike, is delivered as "street" or wagonload grain. Prices for nonpool grain in such small lots are quoted at a spread under car-lot prices, which are used by the trade in its comparisons. The amount of this spread varies at different times but is seldom, if ever, less than 5 or 6 cents per bushel. At times it has been much higher. The nonpool

farmer who delivers grain in less than carload quantities is subject to this discount. In the case of the pool member, however, the price he receives for street grain is the same as for carload lots, except for the difference in handling charges allowed local elevators. This difference amounts to about 3 cents. (There is no difference in Manitoba when grain is delivered to pool elevators.) Unfortunately, the prices paid by local elevators for nonpool street grain are not known, so that comparisons cannot be made with any degree of accuracy. The only nonpool price that could be compared with pool prices would be one based on both quantities of grain sold and prices received and thus far it has not been possible to compute such a price.

For purposes of rough comparison, however, the Bureau of Agricultural Economics, United States Department of Agriculture, for several years, has computed an average price, using the quantity of grain delivered daily by all farmers and cash closing price for car-lot grain on the Winnipeg market.[5] Since there is relatively little difference in the rates of delivery of grain by pool and nonpool farmers, these prices are likely to be fairly representative of the prices received by nonpool farmers for carload lots of grain. Those who delivered street grain were subject to the discounts or spreads already referred to. The results indicate that nonpool farmers, over the period of three years, have received slightly less than pool members. Such a comparison, while still inadequate, is much more reliable than that sponsored by the grain trade.

Effect on World Prices

The effect of the Canadian pool on world wheat prices, if any, can never be satisfactorily measured. The same thing would hold true even if larger quantities of the world's surplus were similarly controlled. Whatever effect strong cooperative agencies might have on the world price level will be shared by competitors, thus preventing the use

[5] Published by United States Department of Agriculture, Bureau of Agricultural Economics, Foreign Service WH-2. The yearly prices are the averages of the weekly averages of daily cash closing prices for No. 1 Northern wheat on the Winnipeg Grain Exchange, weighted by weekly elevator receipts and platform deliveries. The resulting prices are: 1924—$1.66, 1925—$1.42¾, 1926—$1.42. Pool prices for the same years were $1.65, $1.45 and $1.42 per bushel.

of competitors' prices as a base. Nor would the situation be changed, were the wheat crop of the world under complete control. Comparisons in such a case would have to be made with previous prices or with prices as they might have been under open competitive conditions. Such comparisons have frequently been made on behalf of the Canadian wheat pool, but obviously they lack conviction.

The effect of the Canadian pool on world prices is, therefore, impossible of satisfactory measurement. Such comparisons will, of course, be made and the reasonableness of the results obtained will be convincing or otherwise depending on one's point of view. The opinions of very competent authorities on this continent and abroad support the contention that the Canadian pool has had a pronounced effect on the world price level. Opinions to the contrary are not lacking, however, and so the argument will continue.

Members Take Pride in Accomplishments

It is believed by some that the local elevator of the United States, which is owned and controlled by farmers of the immediate vicinity, is more democratic than larger organizations represented by the cooperative elevator companies and wheat pools of Canada. The basis for this contention rests in the fact that the American farmer has his money invested in a local enterprise and can exercise his control directly. The Canadian producer, on the contrary, invests his capital in a large company and has no direct control over the local elevator built at his station. Similarly one may argue that a person takes a more direct and personal interest in his local school district or municipality than in a state or national government. But is the local institution more democratic than the larger unit? And is there not a state or national pride developed within the individual which is greater even than any local pride?

Farmers of Western Canada take a keen personal interest in their accomplishments in grain marketing and it is doubtful if there exists anywhere in the United States a stronger feeling of democracy. It is also noticeable that there is in Western Canada a keen satisfaction, derived

from the successful operation of large-scale organizations, which is lacking in the grain-producing region of the United States.

The combined volume of grain handled by the three western provincial pools and the United Grain Growers, during recent years, has represented approximately 60 per cent of the marketable Canadian crop. The total number of country elevators owned exceeds 1,300. Terminal elevator capacity owned or controlled exceeds 50,000,000 bushels and the total investment in grain handling facilities operated by these four agencies amounts to more than $30,000,000. This is a record of accomplishments in which farmers may well take pride.

Indirectly, the farmers' companies have added materially to the incomes of western Canadian farmers. Reference has been made already to the attitude of the cooperative elevator companies on freight rates, tariffs, taxation and grain trade legislation. Since the advent of the pools, the interests of western farmers have been still more thoroughly safeguarded. Legislation, both provincial and Dominion, favorable to grain producers is credited directly to the efforts of the pools. Lower production costs are the result, and it is safe to say that the favorable position of Canadian wheat producers compared with the position of American producers in this respect is in large measure due to the efforts of their large-scale associations.

Reasons For Success

The accomplishments of the Canadian pool, speaking of the several associations as a unit, is not due entirely to the fact that it is a "pool." Had it been organized with the same understructure that characterized similar efforts in this country, it probably would not have been in existence today. Contracts and pool methods of selling and of paying growers have contributed materially to its success, but these are not the most important features.

Ability to successfully organize the Canadian wheat pools is directly attributable to the fact that, for nearly 20 years, farmers had been in the habit of looking at the grain mar-

keting problem as one concerning the whole producing region—not a particular community. Confidence in their ability to operate large associations had been instilled in both farmers and business interests by the successful operation of the large cooperative elevator companies. During these years of activity, a group of cooperative leaders trained in large-scale grain marketing had been developed. These things made the task of organization easier in Canada than it was in the United States, where progress was impeded by investments and personal interests in local farmers' elevators.

Having successfully organized their associations, Canadian producers proceeded to adopt the principle of operation which combined local and terminal elevators with terminal associations. This has insured volume of business and provided sympathetic local contact agencies, which are necessary to the success of any large cooperative.

There are, of course, a number of other factors which have contributed to the success of the Canadian associations. These are factors, however, which would favor any large-scale cooperative activity in grain marketing. Some of them are as follows: (1) The fact that the bulk of the Canadian crop is exported; (2) the importance of the wheat crop to the economic life of Canada, particularly the west; (3) concentration on particular varieties of grain and greater uniformity of crop movement and market conditions; (4) existence of a banking system which facilitates large-scale cooperative activities; (5) support of provincial and Dominion governments. One might profitably enlarge upon these features, but important as these are, or have been, they would not insure the successful operation of the present associations. While it is admittedly difficult to decide which is cause and which effect, it is believed that the success of the present associations is due primarily to the background of cooperative experience which they inherited.

Future Prospects Compared

What the future holds for the Canadian grain marketing movement is a matter of opinion. Up to the present both cooperative elevator companies and pools have been oper-

ated successfully. The former have been in existence long enough to prove that the principle of operation adopted is sound. The latter have been operated for only 5 years, but during that time they too have been successful. Some will naturally feel that a longer period of experimentation is necessary before complete success is demonstrated beyond question of doubt. Many have been looking for the failure of the Canadian wheat pools. Such persons reason from the experience of certain large pooling associations in this country, notably the tobacco pools. When taking this point of view, however, one should not fail to recognize that there is a different background of experience in Western Canada as well as a difference in present setting. A going concern with all of the physical equipment and experienced personnel necessary to handle grain, plus the precedents of over 20 years of activity in large-scale marketing, is in a different position from an organization of mushroom-like growth which lacks these essentials.

No organization or movement is absolutely assured of continued success and the Canadian wheat pools are no exception. There is, however, not likely to be any abandonment of the principle of large-scale grain marketing in Canada. If sentiment swings toward modifications of present methods of doing business, these can be adopted by the pools. At the present time, however, there is apparently little desire for changes in present methods of operation except on the part of those who have never embraced the pooling principle.

As for the United States, the situation is not quite so clear. The farmers' elevator is still the dominant institution in grain marketing and will undoubtedly remain so for some time. There are, however, fewer elevators today than five years ago. In many cases the local elevator is passing from the control of local farmers, either because of financial difficulties or as the result of changing population. There is also an increasing realization that the local elevator is primarily an assembling agency and not a marketing organization in any effective sense. The evidence of this is to be found in the existence of eight state or re-

gional wheat pools and as many more cooperative commission companies. There are others outside the ranks of the existing associations who feel the need of greater participation in actual grain marketing by farmers, but who do not feel disposed to support existing efforts.

What then is likely to be the next step? In the absence of any unusual development capable of stirring public sentiment to a high pitch of enthusiasm, there is not likely to be any spectacular change in policies. Many, of course, do not feel that there is a need for any material change. The emergence of an outstanding cooperative leader, capable of arousing grain producers to new heights of enthusiasm for large-scale cooperative associations, might bring about sweeping changes in present methods. It is doubtful, however, whether this could be done without the added psychological effect of disastrously low prices. A severe decline in prices would probably do more than anything else to swing farmers into line with a terminal marketing movement.

Progress in the direction of terminal marketing, at this time, is more likely to come from a "building up" program than from revolutionary tactics. Whatever progress is made should be such as to utilize existing facilities. No movement for extension of activities will get anywhere if it underestimates the strength and accomplishments of our dominant farmer-owned grain marketing organization—the farmers' elevator. Roughly 415,000 farmers hold stock in these elevators, and for several decades they have been looked upon as important local business units. The local manager is anxious to make a success of his enterprise and jealously guards the prestige given him as manager of an independent organization. There is often a close financial tie-up between the local elevator and some terminal commission agency and a personal bond of friendship between the local manager and the officials of the latter organization. All of these factors tend to perpetuate the local elevator as an independent agency.

Successful operation of large-scale grain marketing associations, however, requires a close working arrangement with local elevators. Existing agencies, therefore, whether pools or commission companies, must strive for a closer

tie-up with elevators. Neither agency is likely to make its greatest contribution until it is assured of its necessary volume and has some direct control of the same. This also implies control of terminal facilities capable of adequately handling the grain received from country points. It is of interest to note, in this connection, that the greatest savings of the Canadian associations, both pools and elevator companies, have come from the operation of terminal elevators. There is apparently ample storage space at the larger terminal markets in this country to take care of the crop, and so there was in Canada before the advent of the pools. But acquisition of available terminal elevators by farmers and concentration of large volume, such as a successful cooperative association can obtain, will utilize the acquired elevators to better advantage and will show material gains.

Existing associations, whether pools or commission companies, may well consider a program of expansion. The wholesale acquisition of country and terminal elevators is not advised, but here and there are elevators that are passing out of farmers' hands. By stepping in wherever conditions warrant such action, it may be possible to retain these elevators as farmers' organizations but under control of, or having a close working agreement with the terminal association. In other cases, agreements may be made with local associations to effect a closer working arrangement and some degree of control by the terminal association. Care must be taken to safeguard local interests in all cases.

Kind of Organization

There will be differences of opinion on whether future developments should directed toward the formation of line elevator associations, commission agencies, or wheat pools. Apparently, we are not to see any immediate agreement on form of organization and methods of operation. Perhaps such an agreement is not necessary. Sometimes it is desirable to experiment for a time with different types of agencies. Such an experiment is now being conducted in Canada. It is infinitely better to develop along two different lines than not to develop at all. There is room in this

country at the present time for different types of large-scale cooperative grain marketing associations. Experience must determine what the ultimate development should be.

As matters now stand, certain of our larger cooperative grain marketing associations may fail. Certain others that are strengthening their contact with elevators will increase their business. This much is almost inevitable, but the experiences of the last 10 years in terminal marketing have taught some interesting lessons and it is probable that they will bear fruit. It will not be possible, however, to duplicate in this country the Canadian achievements of 1923-24, because the background and present foundation for cooperation are different, but it is possible to improve grain marketing conditions by adoption of some of the principles fundamental to the success of the Canadian associations. Greater benefits to grain producers will come through a closer coordination of country and terminal elevators with centralized selling, but, in attaining this objective, present institutions and the accumulated experiences of the past 30 or more years must be recognized.

A STATE PROGRAM OF FARM ORGANIZATION RESEARCH[1]

H. C. M. Case
University of Illinois

The objective of farm organization research undoubtedly is to aid in improving the organization of individual farms. In order to accomplish this purpose, the plan of research must approach the problem in a way which will appeal to farmers from both the standpoint of results obtained and their application. Farmers, like any other group of thinking people, want recommendations to be based upon fact rather than theory. It may not be amiss to say that the research student needs a foot-on-earth contact with agriculture, including practical experience in handling data, and contact with farmers, to insure balanced farm thinking. This may well be the first step in a program of farm organization research.

An increasing number of farmers are ready to accept well-grounded recommendations based upon laboratory and experimental research of our agricultural experiment stations. The depicting of facts shown in the production and financial results on the farms in any community and the setting forth of these results puts reality into farm organization work, especially when the facts bear out the results of experiment station research under controlled or partially controlled conditions. Furthermore, the farm organization investigator who must live with the situation that he to some extent is responsible for creating, will find his days of credence among farmers lengthened when he sets forth how certain farmers have attained a greater degree of success than their neighbors, rather than when he presents merely an office calculation of the expected success of a hypothetical farm organization. The former places the responsibility for success or failure primarily on the farmer's own ability as a manager, the latter, on the investigator. A sound farm organization research program cannot avoid research that delves into the farm business and substantiates theo-

[1] This paper was read at the eighteenth annual meeting of the American Farm Economics Association at Washington, D.C., December, 1927.

retical conclusions with a statistical and common-sense analysis of farm and market facts.

Adapting Research Program to Area Studied

It is not believed that a successful plan of farm organization research adapted to one region is necessarily best adapted to another. Differences in the actual production and possible production of different regions, as well as differences in the characteristics of farmers, may materially affect the most satisfactory plan of research in different areas. Farm organization research has gone far enough to show that in most regions desirable systems of farming place emphasis on one, two or three final products which are the basis for the entire organization of the farm, selecting such other enterprises as may have desirable complementary and supplementary relationships. The study of farming over wide areas or even within a single state, shows that there are a large number of farming-type areas which differ in the major sources of income. These differences may be attributed to natural, biological, and artificial factors. Within each there are, of course, many types of farming but a particular type of production seems to predominate. We may be assured that this prevailing type of farming was quite well adapted to local conditions at some time but whether or not it is adapted to present conditions is the object of our research program. This may be illustrated, for example, by referring to a particular State. In Illinois, a careful study of products sold from farms in the different parts of the State show that there are eight areas that show important differences in the prevailing type of farming, although within each area many types of farming are found. Some of the differences are wide variations in crops produced, which are largely due to natural factors, such as fertility of the soil, the ease with which it is tilled, the length of the growing season, the rainfall and the topography. The crops adapted to the natural conditions play no small part in determining the kinds of livestock produced. Biological factors, such as disease and insect damage may be either temporary or permanent factors influencing the type of production. Factors

of artificial or man-made type include transportation, size and location of available markets, labor supply, credit facilities, competing regions, character of people, legislation, and last but not least, the introduction of new enterprises. The combined effect of these and many more natural, biological and artificial factors, all of which have an economic bearing, indicate that changes in the organization of farms in one area to meet economic conditions are not necessarily indications of what changes should be made in another area. Each area may well be considered a separate unit for farm organization research. The greater the difference between these areas, the greater the justification for putting on, within each, special studies designed to obtain farm organization facts specifically applying to the area in question. Furthermore, it should be recognized that within each area, there may be several successful systems of farming. If for no other reason, this may be due to the fact that all farmers are not equally adapted to doing the same thing and it would be an error to recommend that they follow too closely the same plan of production.

Research Should Depict Principles

In deciding on the approach to the research program for each area, it would seem that the time has arrived in the development of the farm management field when it is possible to set forth certain principles of good farm organization that apply to agriculture over large regions like the corn belt and in the main apply to any section of the country. For example, studies made in Illinois indicate that for all of the different farming-type areas there are certain factors which apply in each with a regularity which would justify referring to them as principles of good organization. This no doubt is true of other States. These principles might be listed as follows: (1) good yields help reduce cost, (2) a large percentage of the higher-profit crops adds to the farm profits, (3) efficient livestock reduces cost of production, (4) the production of livestock adds to the farm income, (5) a well-organized farm helps use available man labor advantageously, (6) costs are reduced when the supply of horse and mechanical power fits

the farm needs, (7) buildings, machinery and other equipment costs must be kept under control if low costs are to be obtained, (8) diversity of crop production helps insure long-time profits, (9) production planned in accordance with market demands makes for success, (10) a large volume of business is necessary for profitable farming, (11) a good farm layout and a well-developed farmstead make for economical operation. Other principles might be set forth, but most of them could be included in the above headings. While these so-called principles seem to apply to successful farming in any part of Illinois, the relative importance of them in different areas of the State depends upon natural, biological, and artificial factors which determine the best types and systems of farming for particular areas and farms from the economic point of view. As the science of farm management develops, we may expect the principles set forth to be further refined and to be grouped according to primary and secondary importance, placing in the latter group those which either supplement the first or are of less importance.

Methods of Securing Primary Data

After having recognized principles of good farm organization applying to any area in greater or less degree, it is just as important that the adaptability of the different methods of farm research be fully recognized before setting up a farm organization study. Research which is being promoted by various farm management investigators shows that different groups place varying degrees of emphasis on different methods of research. No doubt this difference in emphasis frequently indicates a recognition of the specific adaptability of certain research to existing conditions. On the other hand, it is conceivable that some emphasis is placed on certain methods of research because of the training, preference or prejudices of the investigators.

Farm organization research has advanced to a point where it should be possible to distinguish points of strength and weakness in the various methods at our disposal in attaining the objective of the research project. It is well to think through to the final solution of the problem and

to associate those methods of research which will ultimately provide the information needed to set forth clearly the salient principles pertaining to successful farm organization of the region, rather than to rely upon the facts secured from a single method.

While in the past many farm management research groups have had to content themselves with inadequate activity because of lack of financial assistance, the increase of funds available to all States for economic research makes this an opportune time to examine critically the various methods with a view to formulating a farm organization research program adapted to the conditions of the particular State in question.

A résumé of farm management investigations indicates that the research worker has at his disposal four well-recognized methods, namely, (1) detailed farm cost-of-production studies, (2) the farm business surveys, (3) farm financial and production records, and (4) enterprise cost-of-production studies. In addition, there are various intermediate methods, such as farm power studies, or studies of a particular practice, such as harvesting grain with combines which may call into use certain features of different methods.

Detailed Cost-of-Production Studies

Detailed farm cost-of-production studies begun in Minnesota in 1901 and continued under the methods of research developed during the next few years, stand out as the first method of careful farm organization research. The possibility of obtaining basic facts regarding the material requirements of production of various farm products by the detailed cost-of-production method, is too well recognized to require comment. The material requirements of production, together with the distribution of labor, power, and equipment used, are basic in showing the plan of a well-balanced farm operating unit. Also, detailed farm cost-of-production data are invaluable in showing the complementary and supplementary relationships of enterprises. While the value of studies in determining the money cost of producing farm products has been questioned, it seems that

cost studies are of fundamental value in determining the relative profitableness of enterprises, especially where the enterprises are of a competing nature. In areas like most parts of the Corn Belt, where a large number of crops are well adapted to soil and climatic conditions, selection of crops may go far in explaining the earnings on some farms. Farms may be found with a rotation that gives excellent crop yields, provides a good distribution of labor and power, produces feeds useful in livestock production, avoids insect and disease damage, and provides for many other desired points in a good rotation but which is unprofitable purely because a large proportion of the crops grown are of the low profit group. Economy of operation usually determines that not more than half of the land can be grown to one crop profitably. Also approximately one-fourth of the land in legumes is adequate for helping maintain the soil under most conditions. On the other hand, it should be evident that the larger the percentage of large-profit crops in combination, the greater should be the net returns, if competition for labor and power are not too great. Approved rotations in any part of the country usually provide for a tilled crop for weed control and improvement of the tilth of the soil, a small grain crop to provide for the seeding of a grass or legume crop, and a grass or legume crop to aid in the maintenance or improvement of the soil. However, the number of years of the rotation devoted to each of the three kinds of crops depends upon many natural and economic factors. For example, as shown by cost-of-production studies in central Illinois, corn is the high-profit cultivated crop, wheat the high-profit small grain crop, and alfalfa the high-profit hay crop, while sweet clover is the high-profit pasture crop. Other crops may be listed as medium-profit or low-profit crops in each group. Using this method of analysis, data show that on high-priced land the proportion of land in these four crops with none of them exceeding 50 per cent of the crop area is one of the principal factors in determining farm success. Within the area special crops, such as canning corn and peas, or seed crops, as soybeans, may have an important place. Occasionally, new crops will be introduced and their profitable-

ness as compared with established crops will need to be determined, or changes in the long-time prices of crops or in methods of production may change the relative profitableness of certain crops. Also, where conditions affecting production, such as soil conditions or labor distribution, do not permit the selection of the highest-profit crops, choice may sometimes have to be given to a crop ranking lower from a profit standpoint. Or, to the efficient livestock farmer, a feed crop may have a much greater value than a crop that must be sold directly on the market, even though there is little difference in the net returns per acre based on market prices. It is also difficult to avoid the use of some low-profit crops in selecting a workable sequence of crops from the standpoint of farm operation. For example, some crop grown between corn and wheat is practically necessary in much of the Corn Belt. Hence, while it is not feasible to grow the high-profit crops exclusively, good returns are dependent in no small way upon a considerable percentage of them and sufficient cost of production work is necessary to determine the relative profitableness of the different crops. Since long time results of farming substantiate this approach to the selection of crop enterprises, it eliminates the necessity of considering varying rates for labor put on different enterprises.

Again, actual money costs afford about the only means of comparing different methods of production. The saving of labor and power through the introduction of new equipment is receiving much attention and some weird claims are being made for such displacement. Careful research is needed of the effect of capital expenditure for new equipment on the total net cost of producing farm products. Capital expenditure, especially in a time when owned capital is badly needed by farmers of the Corn Belt, should be justified only by the long-time effect on net earnings from the entire farm.

While some variations exist in the method of conducting detailed cost-of-production studies, there can be no safe departure from recording day by day the current cost facts with rather frequent visits throughout the year from a capable supervisor.

Farm Business Surveys

The farm business survey of the entire farm, which had its origin in New York, in 1907, may well be considered as the best practical means of obtaining a complete cross-section picture of farming. In some regions, where the prevailing type of farming is simple in its organization, this method of study may serve as an accurate enough measure of conditions on the individual farm to afford an acceptable means of aproaching reorganization problems. However, on highly diversified farms conducting a large business, like those commonly found in the Corn Belt, the survey method may fall far short of showing conditions on a particular farm as regards outgo and income accurately enough to be used for specific reorganization. Especially, it may fail of giving a correct picture of the business where large inventories are carried over from one year to the next. For example, in the Middle West, the corn crop harvested in late fall or winter is normally carried into the next year and the year's production of livestock is frequently sold following January 1. Tests in taking survey farm records from men keeping book accounts, show that errors in the labor and management wage determined from survey records over successive years amounted to $500, when the survey record was taken without referring to the account book. Sometimes the error was higher and at other times lower than the real labor and management wage. The errors came largely in the opening inventories, which had to be determined for the year previous and where a large part of the feeds on hand at the beginning of the year were later fed. It is not unusual on Corn Belt farms to find on hand at the beginning of the year, $4,000 to $8,000 worth of products which represent potential income within the next year. With such errors as noted above occurring on farms where a man had given thought to his business and had remembered some facts from his account, larger errors would be expected on many farms keeping no accounts. An error of $500 in the opening inventory, either above or below the true net income, is not necessarily a reflection on either the record taker or the co-operating farmer, but such errors materially affect the rank of a farm among the group

being studied, and therefore destroy their value for a careful analysis of factors accounting for individual success. While the farm business surveys may be useful in type-of-farming studies, they seem to fall short as a method for careful organization studies in highly diversified farming regions where a large volume of business and large investments are common.

Farm Financial and Production Records

The farm financial and production record, developed in Illinois and other States, in 1913 or shortly after, differs from the survey record in that it obtains more accurately the opening inventories and in addition to providing the same opportunity of checking for accuracy as found in the survey record, when in the hands of an interested farmer, it obtains accurately most items of income and outgo during the year. The actual inventory taken at the beginning of the year eliminates perhaps the most unsatisfactory element of the survey record. The best of farmers are none too good as account keepers, but the majority of farmers who keep the financial records will record most of the facts about their business during the year. In this way many items are entered in books which might be overlooked in a careful survey record where the business is large. Also, one has the same opportunity of checking the account for accuracy which he has for checking the survey record for accuracy. Many farmers, of course, have certain records available which will assist in securing an accurate survey record, but this argument serves to prove the added merit of the farm financial record by reason of its more complete record of transactions. It must be recognized that farm account keepers are not average farmers and therefore the account book records must not be accepted as representing average farm earnings.

Returning to the objective of farm organization studies, it must be admitted that farmers have confidence that the farm financial record shows the results of their business better than the farm business survey record. In addition to providing a practical basis for obtaining quite complete information from a large number of farms, the farm finan-

cial record without doubt provides the best vehicle for promoting farm organization extension projects in the better farming regions. It is not sufficient that the research worker satisfy himself as to the fundamentals necessary to successful farm organization; his method of research and the results must effectively reach the individual on his own farm. The close co-ordination of research with extension permits accomplishing this with little delay. As a method of research, the cost of obtaining data is less than by the survey method, when co-operation of extension and research forces is possible. The keeping of the financial record may well be promoted and followed up by the county agent or extension worker in farm management as a basis for sound extension work. Experience shows that the work of collecting and closing the financial records, together with a complete analysis of the data, exclusive of the help of the county agents involves approximately half the cost of records secured and analyzed by the survey method.

Enterprise Cost Studies

Enterprise cost studies, which are of doubtful origin, but concerning which there are reports of over thirty years' standing, and which were developed in account book form at least twelve years ago, take care of a shortcoming of detailed cost studies. The cost involved in detailed cost-of-production studies prohibits the study of a large number of farms. The number which can be studied within the resources of most experiment station budgets does not make it possible to study all the various practices followed in conducting the outstanding enterprises of the region by the detailed cost-of-production methods. For example, a cost route of 15 to 20 farms in an area will not find a sufficiently large number of producers of one product to enable the investigator to study the various practices followed in its production throughout the area being studied. However, one man supervising a farm enterprise-cost study may be able to obtain a large number of records which will enable him not only to have all various practices represented in his data but to have a number of instances from each practice which may be in use. A study of farming types shows

that in most areas some one or two enterprises tend to predominate, and the farmers of that region are primarily interested in the products of these enterprises even though the success of their operations depends on building around the one or two enterprises complementary and supplementary enterprises necessary to the working out of a profitable business unit. It would seem, therefore, in any important farming-type area, that special study should be made of the leading enterprises in order to determine fully the relative merit of the different practices employed in conducting them. It may well be recognized that in diversified farming areas the primary purpose of enterprise cost studies, especially where the enterprise is not directly a competing one, is to provide a means of studying its internal organization and the factors making for its success rather than actual profits. The place of many enterprises depends primarily upon their complementary and supplementary relationships as they affect the profit of the entire farm business, rather than the direct profit realized from the enterprise.

The means of obtaining enterprise costs are too diverse to permit discussion at this time, but it seems well to pause and note that enterprise-cost studies may border too closely on pseudo-research to merit much confidence. However, it should be recognized that some enterprises lend themselves to less exacting study than others. With the more complicated enterprises, such as livestock, it seems desirable to collect the data through supervised records. This may be done through co-operation with some person or agency, such as the securing of dairy enterprise records through the co-operation of dairy herd improvement associations and the cow-tester. At other times enterprise records may be secured through records kept by the co-operators, and supervised by frequent visits from the research worker. The writer believes that care is needed in assuring that research work in farm management be maintained on a plane and, in some cases, raised to a plane comparable with research activities in other lines of experiment station work. This suggestion is made in view of the fact that farm management research is much newer

than that of older established branches of experimental station work.

Use of Research Data

Attention may well be given now to the use of data from these various methods of research in showing to farmers the application of the principles of good farm organization to the farming of a particular area. Farmers, of course, recognize that farms differ in their earning capacity in the same community. Few men apreciate, however, how widely farms differ in their earnings. Also, many men will attribute much of this difference to the "luck and chance" of the market. As preliminary to the presentation of basic research data, farmers should be shown the wide variation in farm earnings within the same community and it should be appreciated that some men consistently make better returns than others from year to year.

Under Corn Belt conditions it is believed that this should be demonstrated from actual accounts. The farm financial records provide a satisfactory basis for such a presentation and when secured from the same farms over successive years, they provide the means of showing that some farms are consistently more profitable than others. Finally, in the whole program of encouraging better farm organization, the financial accounts are invaluable when they can be secured over a long enough period on the same farms to set forth the successive steps in improved organization and increased farm earnings relative to other farms in the community. One of the most gratifying results of farm management work is to find men who after five to ten years of account-keeping and farm-organization effort have been able to improve an average or low rank farm to an outstandingly profitable farm when compared with other farms of the community. Practical demonstrations of this sort used on tours and other extension teaching accomplish more in effecting better farm organization than the teaching of fundamentals by the lecture method, alone.

If the investigator had to keep in mind only the farming group, his introduction to basic data might include merely the use of data from accounts. However, if he did so, he might do an injustice to the farming group in that the

results might be misunderstood by the general public. The public, upon learning of the wide variations in farm earnings, secure fuel for their usual contention that all the farmer needs to do is to improve his efficiency, and they fail to apreciate that the job of making a farm a good business unit has been a task of five years to a generation of soil building, herd establishment or improvement, equipping and other requirements which are a part of successful farm management. Men who keep farm records are better farmers than the average and likewise, do many things that the average farmers will not do. Tests made over three consecutive years in different areas show that groups of account keepers on an average earn from 1½ to 2 per cent more on the total farm investment than the average of all farmers in a compact area such as a township. Also, it may well be noted that crop reporters as a group, come from the same group of men who will keep farm accounts and that their estimates of farm income are apt to be wide of the mark representing average farm earnings. Therefore, an occasional farm business survey of a compact area, giving a cross-section picture of its farming is valuable in keeping before all a correct picture of current farm earnings and the trend from year to year. This presentation of farm earnings using both farm business surveys and farm account book records and showing long-time pictures of success on individual farms should enlist the sympathetic interest of farmers in studying means of improving the organization of their farms.

Adjustments in Organization of Farms

Improved farm organization or reorganization is to be accomplished, not as some men attempt it, by giving renewed energy to some one or two enterprises in which they are already highly efficient, but by giving intelligent heed to all of the principles of good farm organization and applying them in a way that will give a well-balanced farm business unit.

A well-balanced farm business unit would seem to imply considerable stability of organization. On the other hand, the fact that production should be adjusted to market de-

mands from year to year has received much emphasis of late. The desirability of producing those products which are in greatest demand has been set forth too frequently and too well to need much comment. It is at once evident, however, that the possibility of planning production to meet an ever-changing market condition offers different possibilities in different areas. It would seem that there is more need in the Corn Belt of emphasizing a stable agriculture providing for economy of operation and long-time productivity and aiming at long-time trends rather than short-time fluctuations. In the central part of the Corn Belt, farm organization studies will show for many farmers that there is little to be gained by their changing in any large degree the proportions of major crops produced since they are unable to forecast the total production of the country in advance of planting season and it is well known that variations in prices of crops in so far as they are affected by production are the result of crop yields rather than changes in total acreage. For this reason, the Corn Belt farmer who in a large measure produces feed crops, probably will find his best opportunity of adjusting production to market demands through the proportion of crops and livestock products he markets from year to year, rather than through any violent changes in acreages of crops grown.

One will readily see, however, that in areas specializing in the production of one or two crops which in the main are not feed crops that any opportunity of adjustment available will be an adjustment of crop acreage, use of fertilizer or the operating cost per acre. Such farming is apt to be more highly mechanized and costs do not accrue as rapidly when a shift in acreage is brought about as they do in sections of high land value and heavy fixed expenses. Where high land values prevail economy of production depends more largely upon a well-balanced labor and power program.

Moreover, it would seem that in this period when much emphasis is placed upon large-scale production and a low cost per unit of production which has permitted an expansion into what has been regarded as marginal or submar-

ginal areas, that the Corn Belt farmers will most nearly meet the issue by increasing their production to the acre and in this way will not have to submit to greatly decreased land values. Because of the large total investment it is improbable that there will be any marked change in the size of the best Corn Belt farms, where many of the advantages of large-scale production can be secured through co-operation. All this may be merely a vagary of economic theory. It is commonly stated that as demands increase, it becomes profitable to expand production both on the intensive and extensive margins. While we lack the desired increased demand, economy of operation has made possible an expansion on the extensive margin. Why should it not become profitable to expand on the intensive margin as well when the best principles of organization and operation are employed, thus reducing the cost per unit of product both through an increased product per acre and through more efficient operation? Good Corn Belt land is capable of greatly increased production without a proportionate increase in cost, even though some time is required to attain the maximum of desired results where reorganization is necessary.

While mentioning the possibility of varying the products marketed by selling a larger or smaller proportion of them as crop products or livestock products, we may well call attention to the fact that while such adjustments may fit the needs of the average farmer they may be of little consequence to some of the best producers. For example, our best producers of hogs, are able consistently to produce hogs at a total cost equivalent to the price of less than 9 bushels of corn and frequently as low as 8 bushels of corn per 100 pounds of gain. Under such conditions, rarely, if ever, is a year found when such men do not receive market price or better for feeds fed after all other costs are met. Furthermore, might it not be that we would be more successful in teaching many men to produce and market hogs and other livestock or livestock products with a high degree of efficiency than to teach them to be successful forecasters of market conditions?

While this discussion appears to digress from the subject

of farm organization research, it is offered as an illustration of the differences in the farm management problems of different farming type areas and differences in farmers, which make it desirable to adapt the entire research program to the particular area in question and in a way that will meet the needs of the particular farmer desiring help.

Effectiveness of the Research Program.

Whether or not a farm organization research program involving the four methods of research discussed above and calling into use secondary data relating to market conditions is effective in setting forth the farm management principles enumerated, would seem to be answered in whether or not it wins the approval and co-operation of farmers to an extension program based upon this plan, and enables them intelligently to improve the income of their farms relative to other farms in the community. The co-operation of farmers in keeping farm financial and production records in order that they may have a basis for applying these principles to their own farms and the results they obtain is good evidence. However, much stronger proof is shown in the so-called farm-bureau-farm-management-service work, the organization of which was outlined by the writer at this meeting two years ago. The third year of this service is completed with over 200 farmers who are paying about $2,800 a year for the service, while the local farm bureaus are paying one-third as much. Additional funds approximating $3,000 required in conducting this project are made available from the farm management research and extension funds. The success of this undertaking, which was originally organized for a three-year period, is indicated by the fact that a sufficient number of men included in this service have re-signed for the fourth year to insure the continuation of the project without taking on new co-operators.

The reason for the organization of this project in the first place was that men who had co-operated on the regular farm management extension project desired more farm management service than could be given by the regular extension force.

The organization of the project on the co-operative pay basis was made possible by the service previously rendered. Farm financial records had been kept within the area for ten years by a number of farmers. The analysis and interpretation of these records to the farmers had been based not only upon the records they kept but also upon the results of the whole program of research applicable to that part of the State. Preparing the people of this area for the service project conducted on a co-operative pay basis had therefore been an educational process running through several years. With experience gained in this area, it seems probable that similar organizations could be developed in other parts of the State after three or four years of sound farm organization and operation extension teaching, based upon farm financial records kept by farmers and supplemented by a good background of farm organization research.

The continuation of the project can be explained only on the basis that the farmers felt that the value of the work to them justified the cost. While this project was organized primarily as an extension project, it might be looked upon also as a new method of research. The co-operators in this service are paying for what they want to find out about their own business. They are more careful in keeping their records than when similar service is rendered gratis and they co-operate in keeping more records in the form of supplemental feed and production records and records of the produce furnished the home. The supervision of a field man on three or four visits a year to so large a group of farmers, who are keeping careful records, provides for securing a wealth of material bearing on farm practices in connection with each enterprise. Not only do such data show that farmers are getting satisfactory results from methods advocated by the Experiment Station on the strength of its research findings, but it enables obtaining original data from a larger number of instances on many more practices than the Experiment Station might hope to obtain in experimental research. Thus the farm-bureau-farm-management service is a more highly developed project, from either a research or an extension point of view,

than the farm financial and production records kept as a part of the regular farm management extension project. It is believed that the former will succeed best when it follows the latter at least two or three years.

In conclusion it may be said that either the farm financial and production records or the farm-bureau-farm-management service developed with a strong research background, involving all of the major methods of farm management research, renders a service both to the extension and the experiment station forces. It serves extension work in showing farmers which subject matter projects are needed most in strengthening points of weakness on the individual farms and it serves experimental work in showing farmers that the results the better farmers are securing on their own farms are similar to the results obtained by the experimental research of the various subject matter departments.

THE CONTRIBUTION OF FARM MANAGEMENT IN THE DEVELOPMENT OF AGRICULTURAL EXTENSION PROGRAMS[1]

H. M. Dixon
United States Department of Agriculture

The subject for discussion this evening, "Types of Economic Material and Methods of Procedure in their Utilization in Developing State or Regional Programs," is not a new one. It is one to which extension leaders have given increased thought and emphasis with the expansion of the Extension Service organization.

In looking ahead in the development of the Extension Service, it was realized by the leaders that, with the increased demand for extension work came also increased responsibility in formulating the type of agricultural extension program that in the long run would do the most people the most good. They further realized that as farm folks became more acquainted with extension work and learned more of the simpler and easier practices, their demands would more and more center upon the more complex and hard problems of agricultural production and distribution.

In order, therefore, to keep pace with progress in building a substantial vehicle for the dissemination of facts to farmers and others, the task of developing an extension program that will meet the present-day needs and demands of farmers has become a job challenging the best combined thought of administrators, specialists, and farmers. As a basis of sound judgment, we are also experiencing an increasing demand for the careful analysis and relating of all the available facts bearing upon the development of successful agricultural areas, types of farming, and farm organization.

Out of the total of 2,900 counties in the United States that have 400 or more farmers, 2,200 now have a county agricultural agent—about 900 have a home demonstration agent, and about 450 have an assistant county agent or

[1] This paper was read at the eighteenth annual meeting of the American Farm Economic Association at Washington, D.C., December, 1927.

a county club agent. We, therefore, see that to-day we have a very large and widely representative vehicle for the dissemination of facts for successful agricultural development, and the job of making it the success it is to-day and of guiding its future activities along right lines is no small task or responsibility.

If it were necessary to dwell longer on the question of "Why Have a Program?" we would answer: For the twofold reason:

1. We must have a program based upon a background of facts in order to have a grasp of the sound things to do. Not many mistakes are made where the procedure has been set forth through a careful analysis and study of facts. They encourage agreement and lessen argument.

2. We must have a program as a protection against the unsound things we are too often expected to do. Quite often a propagandist, or one conscientious but simply overenthused, comes along with brand new or revolutionary ideas, expecting extension workers to immediately adopt and carry out these new ideas. This disease, although usually found only in individuals, sometimes does show up with organizations.

A program based upon facts is the safest instrument of measurement in getting at the net worth of the many suggestions extension workers are faced with continually. It should be organized and conducted from the standpoint of the best interests of the farmer, the farm woman, and the boy and girl. It should set forth a broad rural development program, including the farm, the home, and rural youth, that each may see and carry out his part. It must include the individual, community, and the national phase.

Considerations in Determining a Program

Having gotten before us some of the reasons why a program is important, perhaps the next question to be raised is "What Should Enter into the Determining of a Program?"

The agricultural extension program should be based upon an analysis of facts regarding what has happened and what is happening in agricultural production, prices or costs,

movement, and consumption. We should know the trends and present and prospective developments and relationships. Particular types of economic material useful in determining programs are taken up by Mr. Fuller of North Dakota.

Utilization of the full resources of the agricultural college, experiment station, and U. S. Department of Agriculture staff is essential in developing the agricultural extension program. The research men have the facts, and the Extension Service is in a position to use them. In fact, it is our daily business. There is a big job of assembling, relating, and applying the facts. Unless it is the job of someone to assemble and relate this material and the right type of organization and procedure is set forth that inspires real team work of the full extension organization, it will not be utilizing its full resources, nor will it give its largest possible returns. Extension work has about reached the size and about reached the period in its growth when someone could well devote full time to this important activity. In some states, this has already happened. Present-day procedure is no reflection on past procedure. A 1915 automobile was all right in its day but would not meet present-day traffic pressure as effectively as the 1928 model.

The Farm-Management Program

The farm-management extension leaders are in full accord with the movement of increased emphasis on fact analysis as a basis of improving extension programs. At the start of farm-management demonstration work by Dr. C. B. Smith in the northern and western states in 1914, he stated that one of the principal objectives of that work should be that of aid to the county agent in securing and analyzing the type of data that would keep his program consistent with the facts regarding farm-management developments in his county. To be more specific, the object of farm-management demonstration work as set forth in the Federal project July, 1914, was as follows: "To conduct demonstrations for the definite purpose of (1) increasing the farmer's net income, (2) increasing the efficiency of the county agent's work.

In 1921, in setting forth the objectives of various phases of agricultural extension work, Doctor Smith stated as follows regarding farm-management extension work:

"We believe in farm-management extension work. It has a basic, long-time value outweighing the difficulty of showing results immediately.

"We believe that 30 to 50 actual farm records in every county every year furnish a helpful guide to the county agent as to what is actually happening on the farms in his county. The analysis of such records serves to keep his plans consistent with the facts. This should be the ultimate goal toward which farm-management extension should be directed.

"We believe that the farm-management demonstrator should have a large part in the final determination of every county agricultural extension program. Any extension program over a period of years will fall short of its possibilities unless organized and carried out with full comprehension of the trend of economic events.

"We believe that the farm-management demonstrator should be supported by a strong agricultural economics department at the college, doing original research work within the State and rendering substantial aid in interpreting and disseminating fundamental information."

The objectives of farm-management demonstration work have, therefore, been quite definite and clear-cut for many years. The States to-day showing the largest results are those that laid out a rather definite long-time procedure several years ago. They knew pretty definitely where they were going at the time of starting, had sufficient man-power to do the job, and have stayed pretty close to a definite course. I mention this mainly for the reason that, unless we build a program with rather definite cumulative results, we will not be in a position fully to contribute our share in the basic-fact analysis in program determination.

The following outline is set forth in the way of specific types of facts that the farm-management extension leaders are disseminating through the use of the various approved extension methods. Research facts supplemented by local facts supplied by farmers who cooperate with the county

extension service in keeping and summarizing accounts are the basis. It is designed to give farmers both the internal and external facts essential to good farm organization and operation procedure.

1. Facts about farm incomes and cost of operation and why some farms pay better than others. Among the more significant factors the following are important:

a. The effect of size of business on efficient operation and satisfactory income returns.

b. The relationship of enterprises in an efficient and profitable farm business.

c. Cost of production and the reasons back of the wide variation from farm to farm.

d. The many related factors affecting income.

These problems are being approached through the use of simple farm accounts and enterprise-cost accounts. To keep the importance of these individual farm factors continually available to farmers, as well as to fully understand them as a guide in extension program development, we believe that every county agent should have from 30 to 50 records kept, summarized, and analyzed each year. It is a program aimed to help farmers to make more money by adopting improved farm-organization and management practices.

2. Facts about price, production, and distribution trends for the various agricultural commodities. The reasons are given so far as can be pointed out about immediate and long-time changes and situations for the different farm products.

Lectures, local-leader training schools, farm-business clubs, commodity clubs, circular letters, news articles, etc., have been the main avenues or means of dissemination of this material.

"The Agricultural Situation," issued monthly, and "The Agricultural Outlook," issued annually by the Bureau of Agricultural Economics, are examples of the type of information being used. The principal objective of this type of work is that of helping the farmer to procure the type of facts that best enables him to look ahead in the planning of his production and operation programs.

This illustrates the two principal types of subject matter used in developing a farm-management extension program. Time will not permit an analysis of the various means and agencies used, but it should be said that we find farm-management subject matter lends itself to the use of all approved methods of extension the same as other lines of extension endeavor. Much development has been made in applying approved methods of extension to this subject, but much is still to be accomplished. We have sometimes been criticised for being unable to make the contacts in farm-management extension work that were made by other subject-matter specialists. Perhaps in some cases the criticism was justified. At any rate, the situation is such in a number of States at the present time that the farm-management specialist is making as many contacts as any other specialist on the extension force. The outstanding reason for this as previously indicated is the application of the various means and agencies in approved extension procedure.

3. Aid in developing sound extension programs. The material referred to in 1 and 2 is also used for meetings held with other specialists, supervisors, or administrators in formulating extension programs. After these data have been properly related with facts of other specialists, meetings are held with groups of farmers where the facts are interpreted by the farmers into an extension program. These meetings have been of State, regional, and county types. This is a program organized and conducted by administrative supervisors of extension work designed to make the whole extension program the most efficient. Farm-management workers participate to the full extent of their resources in the working out of programs or the solution of specific problems.

From the educational point of view, this largely means developing not only new subject matter but a new approach and a new application of already known principles and facts to extension program building. Mr. Eugene Merritt of the Extension Service will have more to say about this phase of the program.

Benefits to Farm-Management Workers

The benefit of this movement to assemble, interpret, relate, and apply facts in the development of State, regional, or county extension programs are twofold from the standpoint of the farm-management worker.

When properly organized and carried out, the economic facts should aid other extension workers to view the various commodity lines of production from a farm unit standpoint. The material should show the importance and the relationship of a given line of production to other lines for different areas or different types of farming in a successful farm business. The farm-management material represents a cross-section picture of the farm business. For example, we have in some certain counties a summary of financial records on 30 to 50 farms for a number of years. How does the county agricultural agent use this summary in order to adopt a better county program of work? In most programs, there are too many projects rather than too few, so that the task is one of selecting a few projects that are of most importance in the county.

The summary of these accounts has been prepared by the farm-management demonstrator and the county agricultural agent to show the factors that have most influence on determining farm profits, such as livestock efficiency, crop yields, per cent of land in high-profit crops, etc. The summary will also show what per cent of the total income on these farms is from cattle, hogs, poultry, corn, oats, wheat, etc. Good judgment would indicate the advisability of carrying projects on the important enterprises and in such a way that the results procured would lead to practices that will improve the important factors influencing farm profits in the farm as a whole. In other words, county agents are not so much interested in improving an unimportant part of the business and, therefore, desire to choose first the lines of work that will increase farm incomes most.

If the county agent finds from the summary that it is highly important to increase crop yields and that corn is the most important crop, he will then turn to the agronomy

specialist for a project that will increase the yield of corn. He may favor a lime-and-legume program in connection with a project on corn-disease control or field seed selection. When he turns to livestock efficiency, he may find that hogs are the most important class of livestock, and the livestock specialist may feel sure that a swine sanitation project is the outstanding need for increasing profits on hogs.

This process is continued until the important phases of the work have been covered and certain projects have been rejected because they would have less bearing on farm profits.

From this process we see that in the last analysis the county agent must mainly shoulder the responsibility of what should be included in the county program of work. To the extent, therefore, that the county agent has records and facts he speaks with a voice of authority. His whole attitude and bearing is of a man who knows. His word carries conviction. Farmers believe in him because he has facts back of him and his feet are on the ground. Surveys in 15 States show that faith of farmers in the extension agent is one of the biggest of all factors in successful extension work and in getting new practices adopted. Local facts are the big things. Facts as shown by records on 25 to 50 farms are, therefore, of the highest importance.

On the other hand, when properly organized and conducted, the relating of the economic facts to production facts is most helpful to the farm-management and agricultural-economic workers. We must not become so involved in formulating mathematical puzzles that we lose sight of the fact that the individual farmer, to be successful, must adopt improved and economical production practices and at the same time have something to sell. In addition to the better adjustment of production to demand, efficient production still seems to be a factor in successful farming. We must also keep in mind that in most instances extension folks, as well as farmers, are interested in applied agricultural economics.

Twofold Responsibility of Extension Specialists

Extension specialists make large contributions in the building of programs. They should continue to do so, but it should be fully realized that every extension specialist has a twofold responsibility in formulating and projecting his program.

1. They must outline and project their own lines of work to make them the most efficient.
2. They should relate their own lines of activity to other extension endeavor to make the extension service organization as a whole the most effective or efficient.

Perhaps in past performances the stress has been placed more upon efficient plans along individual lines than upon relating the various lines of endeavor to make the extension programs as a whole the most effective. Developments at this time would seem to indicate that the emphasis could well be placed upon the latter responsibility.

In conclusion, it, therefore, appears that the increased emphasis on fact analysis as a basis of program development, to be of greatest benefit, must be designed to give all those interested in agricultural development a picture of the problems—their relative importance—the type of program to meet the problem, and the contribution of the various subject-matter departments, agencies, and farm folks in improving or solving these problems. To the extent it succeeds in this respect, it should make the job of every extension worker a bigger and more definite job and the whole organization more efficient.

FARM MANAGEMENT DEMONSTRATORS' AND AGRICULTURAL EXTENSION PROGRAMS[1]

E. MERRITT
UNITED STATES DEPARTMENT OF AGRICULTURE

I am glad of the opportunity to meet with you to discuss the contribution that is being made by the department of agricultural economics, especially by the farm management demonstrators, toward the development of sound extension programs in the 11 Western States.

When this work was undertaken the first problem presenting itself was to determine what was the content of the present extension program. To illustrate, when a study of the extension activities relating to wheat was made, it was found that the most emphasis was put upon the treatment of seed for smut and the use of improved varieties. This was true of practically all the other cereals. With potatoes it was seed treatment and disease control; with livestock, the treatment of hogs for cholera, beef cattle for blackleg, and testing of dairy cows for tuberculosis. It can readily be seen that these activities relate primarily to some of the so-called production practices within the enterprises.

Having determined what the contents of the present extension programs were, the second problem was to find out what were the more important changes the farmers were making in their systems of farming. When the different agricultural areas were studied it revealed that the farmer was far more active in readjusting his enterprises than he was in improving his yields. In practically every State the increases and decreases in number of livestock and in acreage of different crops were greater than the increases or decreases in yields.

This fact led to a third problem—that of analyzing the farmer's thinking and determining when in the processes of carrying on his farming he made the changes that brought about these readjustments, and what were the most significant steps in the conduct of his business. Perhaps

[1] This paper was read at the eighteenth annual meeting of the American Farm Economic Association, at Washington, D.C., December, 1927.

the easiest way to get at this idea is to begin with a young man who is about to take up farming. His particular problem will be to determine what type of farming he should choose—poultry, dairying, potatoes, wheat, or cotton. As soon as he has determined this he will be faced with the problem of whether he is going to buy or rent, how large a farm to get, or how much rent, or what price to pay for a farm. Having obtained the farm, the next step will be to determine what crop and livestock combinations he should have and how much of each. Having determined this, his next choice will be what land he is going to use for different crop purposes. And these are followed with the various steps in preparing the land, planting the crop, cultivating, harvesting, and marketing.

By comparing the phases of farming that are emphasized in the extension program with these steps it can be readily seen that in most instances the farmer has made the vital choice before the extension agent begins to influence his action. That is, he may be in the poultry business in the wrong area or with the wrong size flock. The extension worker can suggest improvement in the farmer's methods, but the farmer has made a fundamental mistake which in most instances he will not be able to overcome by merely changing his methods of production. Therefore it was decided in the West that the present extension program would be continued but attempts would be made to organize facts that would enable the farmer to readjust his enterprises with less chance of making a mistake than formerly.

As soon as this organization of facts was undertaken it was found that the farmer and the staff of the agricultural college did not think in the same manner. Expressing it rather crudely, the thinking of the institution is at right angles to the thinking of the farmer. The college staff thinks of bacteriology as it applies to all types of plants and animals. The same is true with reference to entomology, genetics, marketing, and the like, but the farmer thinks of these things only with reference to the enterprises he has on his farm. In other words, the farmer is "enterprise minded." That is, the dairyman is only interested in bacteriology as it applies to dairying. This is true of en-

tomology, genetics, nutrition, marketing, and so forth. Therefore, instead of using the staff as it is at present organized, the members of the different subject-matter departments were assigned to what is called "enterprise or commodity committees," i.e., arrangements were made for one committee on poultry, which was to assemble all the facts relating to poultry; another on dairying; potatoes, wheat, lettuce, and so forth.

The dairy committee would naturally have some one from the dairy department as chairman, but it might also have some one from the crops or the bacteriology department as a member of the committee. In the same way, most of the forage crops committees have some one from the dairy group or the animal husbandry department as members for their committees. Over the enterprise committees was the general steering committee composed of the director of the experiment station, director of extension, dean of the college, and in most instances, the president of the institution. Attached to this overhead committee was a general secretary, who was a member of the department of agricultural economics. If there was a farm management demonstrator, in most cases he acted in this capacity.

As soon as these committees were organized their first job was to make a complete inventory of the information they considered necessary to determine what readjustments should be made in their enterprises in the different agricultural areas in the State. Suggestions were received from everyone within the institution, and in most cases, county agents, local bankers, business men, and distributors of agricultural products were also consulted. When this inventory was completed, the committees met with the general secretary to determine where the information could be obtained and to devise ways and means of assembling it.

In most instances it took two years to complete the inventory and to assemble and digest the information before the steering committee felt that the institution was in a position to meet with groups of farmers to carry on their regional and State fact-consideration conferences.

The usual method of procedure has been to call a two-

day meeting of farmers, business men, bankers, and others interested in agriculture in a county or typical agricultural region in the State. On the day preceding this conference the members of the college staff, who were to participate, met at the place of meeting to round out their information and to formulate tentative recommendations. Usually they were called together by the director of extension. The county agents presented to them what they considered their local problems and the college staff supplemented information they had assembled at the institution with such additional local information as was available. In the evening they presented a statement of what they considered contained the most pertinent facts with reference to the local situation and an outline of their recommendations. These were reviewed by the group so that the college was in a position to present a united front at the conference during the following two days.

The two-day conference proceeds as follows: It is called to order by a farmer chairman. Some one from the agricultural college presents the State, national, and international situation with reference to the important enterprises in the area. This is followed by a discussion by a county agent of the local agricultural situation. Before noon of the first day the entire group is organized into enterprise or commodity committees. These commodity committees consist of a chairman, who is a farmer-producer, and a technical secretary, who is a college-of-agriculture man, and others interested in the particular enterprise concerned. That is, a poultry committee is made up of a poultry producer, some one from the poultry department of the college, as technical secretary, and others interested in poultry production. The same is true of the dairy committee, the beef committee, and the sheep committee.

Before the meeting is held the technical secretary and the chairman have a conference and work up an outline of the problems that should be discussed by their committee and decide who is likely to be present and who is qualified to discuss them.

The procedure in the commodity committee meeting is somewhat as follows: The chairman will bring up a prob-

lem and call upon some one in his committee group who he feels is qualified to open the discussion. After the discussion has proceeded for a while the technical secretary will make a statement that if he interprets correctly the feeling of the committee, this is what should be done. If there is an agreement, that is an indication to the chairman to take up the next problem. The meeting continues on this plan generally throughout the afternoon of the first day and the greater part of the morning of the second day. At the end of the meeting the technical secretary reads back the points agreed upon in the form of recommendations for discussion and approval by each commodity committee. The final recommendations of all the commodity committees are then read back to the conference as a whole on the afternoon of the second day. The recommendations as finally adopted by this group become the agricultural policy for the college and the extension service for that area.

The procedure thus far has been primarily to get sound agricultural programs upon which to base extension programs. Therefore, as soon as possible after the conference adjourns, the extension staff and the county agents review the existing extension program and the recommendations of the conference and lay out a revised extension program for the future.

Some interesting results have come from this procedure. In one area the county agents and the agronomy specialists were conducting an active alfalfa introduction campaign. A study made by the economic and dairy departments indicated that probably improvement of pasture was a far more important factor in profitable farming than the attempt to grow alfalfa under adverse conditions. The result was that the agronomy specialist switched his program from alfalfa to pasture improvement.

In another instance it happened that the fact-organization conference was held in a cotton area while cotton was in a slump. At that time cotton was bringing about 12 cents. The studies made by the economic department indicated that cotton at 12 cents per pound was about as profitable as alfalfa at $12 per ton. The studies of the

animal husbandry department indicated that it had not been profitable to attempt to fatten beef or sheep when the cost of alfalfa was more than $10. It also showed that in this particular area farmers were producing just enough milk to meet near-by whole-milk demands, that if they increased their milk production they would have to reduce their prices to compete with Kansas on a butterfat basis. Therefore, the recommendations of the cotton committee were that cotton should continue to be the principal cash crop and that the farmers should grow enough alfalfa in their rotation to maintain their cotton yields. The recommendations of the dairy committee were that the production should not increase faster than the increase in local consuming population. Here again information assembled through the cooperation of the economic, dairy, animal husbandry, and agronomy departments was being used as a background to formulate an extension program for agronomy and dairy specialists.

In another area the dairy committee recommended that alfalfa should be introduced in order to improve the area's general feed conditions. Here again the recommendations of the dairy committee became the project of the agronomy specialist. In other words, the farm management demonstrator and the dairy specialist assembled material, discussed the problem with the dairymen, and determined upon an activity which had to be carried on by the agronomy specialist. Fortunately, sufficient time had elapsed so that it could be determined what effect the recommendations of the economic conference had made on the extension program and the agriculture of the area. In order to check up the influence of the conference on the local agriculture, bankers, elevator operators, feed dealers, business men, and farmers in the different communities were visited. They were asked to indicate what, in their opinion, had been the most important changes in agriculture in their communities during the last five years. Usually by visiting from 10 to 15 of these leaders a good check could be made in the changes in the agriculture in their respective communities. The changes in the agriculture were then checked against the extension activities of the county

agents and the extension specialists. The following standard was set up against which the latter activities were measured:

(1) What test of the change in farm practice did they make?

(2) How many demonstrations did they establish?

(3) What kind of an extension campaign did they put on?

Under this later standard an attempt was made to determine:

(1) How many and what kind of contacts were made by the extension service with the farmers whom they wished to influence?

(2) What type of appeals were used, such as increase in yields, ability to stand drought, and shortness of growing season?

(3) What was done to assure that the farmers would continue the practice if the extension activities ceased, such as making it worth while for the elevator man to pay a premium for certified seed, to clean it, to treat it, and to make it available to farmers or to purchase certified Grimm alfalfa from a certain source, keep inoculating material on hand, etc., or what we call in extension service, removing annoyances that the farmer might run into in connection with his adopting the new practice? Whenever it was found that the extension agent and and specialist had followed this system generally their program was successful.

The result of this general method of procedure in organizing facts and building up an extension program has been, first, to make the entire college staff realize that in many cases economic influences are as important if not more important than the influences of soil and climate on the profitableness of an enterprise.

In many cases the members of the resident instruction staff have been so impressed by the significance of these methods of procedure that they have used the problems growing out of the fact-organization work for classroom in-

struction. As far as the extension work is concerned, the extension specialists and the county agents are almost universally considering not only whether they have a favorable soil and climate, but what is the outlook for expansion of the particular enterprise in which they are interested. In practically every instance the county agents are following up these economics conferences with detailed studies to determine what are efficient managerial and production practices.

Reasons for whatever success has been attached to this fact-organization work are:

(1) Satisfactory solution to one of the farmer's most serious problems.

(2) Aiding the county agent in getting a clearer vision of agriculture of his county and a more systematic analysis of the farmer's problems and in bringing him in touch with new leaders in his county.

(3) The subject-matter specialist has obtained a keener insight into the factors influencing the success or failure of the enterprises with which he deals, which has qualified him for a more successful leadership of the county agents and leading producers and distributers. All extension workers have been brought into contact with actual situations and the people dealing with those situations. They have had to give full consideration to all the physical, biological, and economic factors influencing success in agriculture.

(4) This type of work has depended largely upon the unselfish spirit with which the economics departments have contributed of their fund of information to the other subject-matter departments in order that the agricultural colleges might take the leadership which they are qualified to assume.

TYPES OF ECONOMIC MATERIAL USED IN DEVELOPING AN AGRICULTURAL PROGRAM IN NORTH DAKOTA[1]

O. M. FULLER
NORTH DAKOTA AGRICULTURAL COLLEGE

In order to find a basis for more profitable farming and to determine a sound agricultural production program for the State, a knowledge of conditions surrounding production within the State as well as changes outside are essential.

Contrary to the opinion of many, farming conditions are widely divergent in different sections of the State, so much so that the trend of production of given commodities often moves in opposite directions. This might not be so pronounced in older sections of the United States.

Usually there are definite fundamental reasons for important changes in the farming business, and some of these are entirely outside the boundaries of the State. It was therefore deemed necessary to make a study of each commodity produced on the farms of North Dakota and determine the world situation as well as the conditions within the country and State.

A large amount of published and unpublished data was gathered and many charts were made showing the trends of production and consumption, prices, costs of transportation, market receipts, cold storage holdings, etc. These facts were obtained from U. S. Census reports, U.S.D.A. Yearbooks, Crops and Markets, Crop and Livestock Estimates and other miscellaneous State and Federal sources.

These data, together with timely experimental data, have been tabulated, charted and placed in mimeographed form and will be used in addition to other information based on the experiences of farmers, in mapping out an agricultural economic program for the various areas of North Dakota.

In the determination of a program for so large an area as this State, it becomes necessary to divide the State into regions or areas. Local conditions affect the production

[1] This paper was read at the eighteenth annual meeting of the American Farm Economic Association at Washington, D.C., December, 1927.

of particular commodities and are among the important considerations which determine the most profitable type of farming for a given region.

Areas within the State having approximately the same volume of production of various commodities and also having a similar trend in volume when related to physical conditions are important factors in determining type of farming areas. It was therefore essential to consider the variation in the elevation of different sections of the State, the types of soils, extremes in temperature, amount of precipitation, topography, etc. These are all essential in determining the kinds of crops to be grown.

The changes in the number and size of farms were also considered. In the eastern part of North Dakota, for example, the number of farms increased steadily from 1910 to 1925, while in the greater part of the area west and south of the Missouri River as well as in many counties in the central and northern parts of the State there was a steady decrease in the number of farms. An analysis of the changes in the number of farms of various counties indicates that for western North Dakota while the average farm is becoming larger there is a decided tendency for the comparatively few large farms to become smaller and the small farms to become larger.

Both the relative and actual crop acreages per farm were determined for a series of years and these were found essential in the delineation of types of farming areas. The yields per acre for each county were obtained for a period of sixteen years, 1911-1926, from the Bureau of Agricultural Economics. The yield of grain crops per acre was found to be highest in the eastern and northeastern parts of the state, but the highest production of hay and forage crops per acre was obtained in the southeast portion of the state. The variability in yields of grain crops was also determined and it was found to be smallest in the eastern section and became greater towards the west and southwest.

The number of livestock of various classes was found to have changed materially in different parts of the State. The greatest density of livestock was found in the eastern

counties, but farmers in the southwest had the greatest amount of livestock per farm, particularly of cattle.

The average gross income per farm was determined, using as a basis the average production for 16 years and the average prices for the past 5 years. Income from the sale of livestock was determined from the carload shipments of each class of stock from each county; income from the sale of butterfat was determined from the U. S. Census reports. This amounted to an average income of $2,268 per farm. Nearly all the counties in the eastern half of the State, three counties in the northwest and one in the southwest exceeded this average.

An intensive study of the above factors pointed out marked differences in production, which were caused no doubt by the conditions under which farming was done in various sections of the State. Using these factors as a basis it was possible to localize areas where similar conditions were found and to point out the direction in which farming was going in these respective areas. These data indicated that there were fourteen types of farming areas in North Dakota sufficiently different from each other to be segregated and the characteristics of each defined. These areas were established on the county basis, the largest number in any one area being nine counties and the smallest being one county. It was impossible to cross county lines because of the fact that most of the data, especially that obtained from U. S. Census Reports, were on the county basis.

While these areas are sufficiently established for general purposes the detailed conditions on individual farms within these areas are of the greatest importance if farmers are to determine their business for the future with any degree of accuracy and success. It was therefore necessary to obtain the actual organization of typical farms within these types of farming areas.

In view of the large amount of data which had been gathered, it was possible to select a group of six to eight townships within these types of farming areas which would be typical of all or the greater part of each area. Farm organization data were secured from the U. S. Bureau of

Census for a total of 3,800 farms, all located in the selected townships scattered over the State and including all the farms in the selected townships.

These data were for the year 1924 and consisted of the following items:

1. Size of farm
2. Crop acres harvested
3. Total acres in pasture
4. Acreage of each crop
5. Number and kinds of each class of livestock

These data were separated and tabulated according to the various sizes of farms within each area. Modal groups were established where possible for each size group on the basis of total cash crops and amounts of livestock in each area. Typical farms were then selected from these modal groups and an analysis made of the present farm organization.

Beginning in 1920 and continuing to date detailed records of farm operation have been kept in various parts of the State so that there are available quantities of data on labor requirements, feed requirements, and the various other items of expense, both in quantity and value, necessary for farm operation. A cost route, maintained for three years in the Red River Valley, furnished valuable material for this area. From these data standard requirements were determined; these were applied to various types of farms to determine the probable net returns of farms of different organization and with different prices. These detailed data from about forty of the fifty-three counties made it possible to make set-ups of probable returns approximating the conditions in all parts of the State.

Since some propaganda had been spread over the State with regard to livestock as a competitor of grain, under any and all conditions and without limit, it seemed desirable to determine the effect of the introduction of various classes of stock in varying amounts on the farms. By the method used, rates for various input requirements, production, and income were identical so that the net result was the comparison of the type of farm organization only. Dif-

ferences in management, in physical conditions and other factors were eliminated. Only farms of the same size and in the same area were compared.

The results showed that not all classes of stock were equally desirable; they showed further that there were certain areas where stock as a competitor of grain brought increased net returns, while in other sections livestock supplementing grain, but not requiring additional hired labor above that of the farmer and members of his family nor other excessive requirements, was apparently the most desirable combination of enterprises.

Relating the results of the expense and income statements to the type of farming areas as set up from the county census data (See N. Dak. Exp. Sta. Bull. 212) it was found that in general the prevailing types as practiced by the farmers of the respective areas, approached the most desirable combinations of enterprises. The detailed analysis of the farm organization of the 3,800 farms above referred to indicated that some were in advance of others in operating desirable combinations; some had apparently gone too far while others lagged behind.

A comparison of types of farm organizations in relation to nationalities of farmers in the areas seems to show that some differences in farming in areas of similar physical conditions may be accounted for by the characteristics of the people themselves. Area studies, in which the origin of the farm population as to nationality has been ascertained through recent sociological studies, indicate that the type of farming that is most successful for one group or nationality may not be the most successful for another group of a different nationality under the same set of physical conditions. In some areas there is a preponderance of German Russians, in others Norwegians and in other Germans; in this State these are known to have different inclinations as to livestock and grain production.

The facts as developed from the analysis of all the data were assembled in mimeographed pamphlets by commodities.

BOOK REVIEWS

Farm Relief, by James E. Boyle. (New York: Doubleday-Doran and Company. 1928. 281p.)

During the past eight years the agricultural problem has been at the fore-front. Many plans for the solution of this problem have been put forward. Practically all of these have been attacked as being "economically unsound." Professor Boyle sets himself the task of proving that the McNary-Haugen plan is in this unsound class, and to do this he marshals an array of evidence. He proves, to his complete satisfaction at least, that if this plan were put into effect it would make the situation worse than it is now. He admits there is an agricultural problem, but maintains that the McNary-Haugen plan of attacking it is the wrong plan and that "it is found to be based on a false understanding of the farm relief problem and to contain serious and fatal defects."

The plan rests, according to the author, on four false assumptions: (1) Congress has done nothing for the farmer; (2) other businesses are all prosperous; (3) Congress has created artificial prosperity for other interests; and (4) the country is now being industrialized at the expense of agriculture. And he proceeds to prove that these claims are false.

The argument against the first false assumption is that Congress created the Department of Agriculture "which is now devoting much time and many millions of dollars to give very direct and specific aid to farmers." Congress also created a Department of Commerce and a Department of Labor, but, the argument continues, these two departments do not go into the field to help organize labor unions or to organize combines among capitalists. It is true, as the author states, that the Department of Agriculture is turning its attention to the problems of agriculture, and it is frankly attempting to do two very specific things; these are: (1) to make it possible for our agricultural resources to meet, as nearly as possible, the demand of this country for its products, and (2) to help the farmer make a profit from these operations. If Professor Boyle had examined closely the activities of the Department of Commerce, he would have found, no doubt, that that department was concerned primarily with the expansion of trade which would aid in making business prosperous, even though it did not help "organize combines among capitalists." One who is not attempting to prove a point would recognize that the purpose of the activities of the Federal Government in the fields of industry, of commerce, and of agriculture have been approximately the same.

The argument continues showing the great number of services which have been rendered to agriculture, including aid to cooperative marketing, the grain futures administration, packer and stockyards administration, crop reporting, agricultural research, Federal Farm Loan and Intermediate Credit systems, tax and trust law exemptions, good roads, and the tariff, but it fails to recognize that many of these services of the department are not exclusively for the benefit of the farmer, and that some of them are primarily for the protection of the consumer.

In the argument against the second false assumption, evidence is presented to show that some business concerns suffered during the 1921 depression and that, therefore, all business is not prosperous.

Thirty-seven pages are used in showing that the third assumption is false. Numerous references and quotations are given to show how much business has suffered from governmental regulations and that business prosperity is the result of efficiency rather than favorable laws. The fourth assumption is false because the "country is being industrialized, not at the expense of agriculture, but to the benefit of agriculture."

It is very doubtful whether 78 pages were necessary to the "proof" of the falsity of these assumptions. In the first place, the mass of supporters of agricultural relief legislation do not rest their case upon the first two. They recognize that Congress has been ever ready to promote agriculture, and they know that all business has not been prosperous. On the other hand, they know that, by and large, business has returned more to its followers than has agriculture.

It is fortunate, however, that Professor Boyle discussed these assumptions rather fully, because it gave him an opportunity to present his rather unique theory of the effects of the tariff. He argues that the granting of tariffs on agricultural products has been a great aid to the farmer, but "that the bulk of the American industries derive no benefit from the tariff." Possibly the benefits which industry has received from the tariff are not as great as is sometimes supposed, but it seems that one must stretch a point purely for the purpose of establishing his case when he claims that agriculture has been benefited by the tariff and industry has not.

The "seven weaknesses of the bill," according to the author, are (1) its vagueness, (2) "its provision for speculation in foodstuffs and cotton," (3) "the compulsory pool feature," (4) "its provision that permanent relief shall be given to certain agricultural crops," (5) it "adopts the slogan 'orderly marketing' and assumes that this device will control the price of wheat, corn, and cotton," (6) "it would increase production," and (7) "the well-established economic principle that Government price-fixing will not work except under certain conditions." The argument on some of these points deserves attention in this review.

In regard to the second weakness relating to speculation, Professor Boyle says: "We already have organized exchanges where speculators, both professional and amateur, can trade under certain rules and certain limitations. But this bill provides that coöperative marketing associations, which are amateurs in this field, may undertake the rôle of the professional speculator." This cloaked defense of vested rights will not receive much support, nor will many persons accept the truth of the inference that it is impossible for the managers of coöperative associations to become just as efficient speculators, if necessary, as any of the private profit-seeking speculators operating in the market today.

It is in discussing the fifth weakness that Professor Boyle puts himself on record again as a staunch defender of the present system of marketing grain. He can see nothing wrong with this system. To anyone who has studied the organization of agriculture and the marketing system, it would seem that we do not yet know enough about marketing to put definitely our unqualified stamp

of approval upon all our systems and practices. It is probable that there are some practices in the markets for staples, and possibly even in the grain market, which do not operate always for the benefit of the farmer. Furthermore, a perfect system of marketing would not take care of the surplus problem, or, as some prefer to call it, unbalanced production.

The sixth weakness is that "it would increase production" since it aims to increase price. An argument follows showing the effects of an increased price on production. If Professor Boyle's argument on this point is valid, any attempt to increase the prosperity of the farmer, by whatever means, would be unsound.

The seventh and "fatal weakness of the McNary-Haugen plan is the well-established economic principle that Government price-fixing will not work except under certain conditions," that is, the necessity of control of production, consumption, rents, interest, profits, and wages.

After showing that the McNary-Haugen plan is inadequate and unsound, the author of this book offers the "right policy." He maintains that surplus is not "the disease with which agriculture is afflicted," but that it is suffering "from a three-fold maladjustment." There is a "lack of balance" (1) in development, (2) in production, and (3) in the marketing of perishable commodities. The case for a lack of balance in the development of agriculture and production is logically presented; but one wonders what process of reasoning was followed to reach the conclusion that this lack of balance does not result in a surplus.

"The right policy" provides for "a maximum of self-help and a minimum of state aid," and an agency which is to be made up of a small but prominent group of experts, to be called the "Farm Board," and a larger group to be called the "Farm Congress," which should be drawn from the ranks of agricultural colleges, experiment stations, the Department of Agriculture, and the farmers themselves. This "Farm Congress" would be "like any convention of business men, a deliberative body without the power of actual legislation." Just how *deliberative* such a "Farm Congress" would be is a question.

The "Farm Board" is to be charged with the duties of making studies, researches, surveys, and investigations; and "to formulate agricultural policies and programs representing sound national policies in all these matters. . . . . Sound national policies would be worked out by the small group and endorsed by the larger groups. Programs of action would be formulated and carried out by the smaller group." Professor Boyle asks whether this "Farm Board" could control development, or production, or marketing, and answers that "they could persuade but not compel." One is tempted to ask just what such an organization could do which is not now being done by the Department of Agriculture, the State colleges, experimental stations, and the extension service. Just how much better could this new type of organization attend to the problems of research and persuasion?

Professor Boyle undertook the job of showing that the McNary-Haugen plan will not work. His arguments have been carried to a large audience through a gratuitous distribution of this volume. Anyone who is interested in agricultural relief should read the book. It seems that there are many people in this country who want to analyze and criticize agricultural relief

plans entirely from the orthodox viewpoint of *laissez-faire* economics. It is very difficult for them to realize that the efforts of the last eight years on this problem have been something more than an attempt to solve an economic problem. If anything is to be done about the problems of agriculture, those who are sincerely interested should lend their aid to a program of construction, even though this might lead to practices entirely contrary to those usually considered "sound economically." The reviewer does not think that the McNary-Haugen, or any other plan which has been proposed, is ideal, nor that it will come up to the expectation of its advocates. It is not improbable, however, that, should one of these plans be given the force of law, something could be worked out which would bring greater benefits to the farmer than the critics are likely to bring. Those who oppose this agricultural relief plan do not advance a better argument against it than could be made against the tariff; yet there are a great many people in this country who endorse the tariff and can show, to their own satisfaction at least, that the tariff has not been a detriment to American business.

John T. Horner

Detroit, Michigan.

Shall We Change Our Grain Marketing System? by James E. Boyle. Toledo, Ohio. Grain Dealers' National Association. Bul. No. 3. 1928. Presumably free.

Grain Dealers' National Association Bulletin No. 3 of the above title, by James E. Boyle, is one of the latest additions to the growing use of dialetic economics as a wet-nurse for good-will advertising.

There are always two tragedies in any such situation. In the first place, primary interest in proving predetermined conclusions admits of enough specious economic conclusions to destroy confidence in any of the other economic analyses, some of which may be good. In the second place, such misuse of information tends to increase the distrust for the good-will advertiser himself though the honest desire on his part may be to lessen this distrust.

The bulletin under review masquerades behind a cover page that immediately suggests a technical bulletin of the United States Department of Agriculture. The resemblance is so striking that, no matter what the motive, there is an impression left of a weak attempt to clothe the contents with an authority they do not possess. But of even more importance to those interested in scientific economic studies, is the misleading presentation of certain economic data in the body of the bulletin.

Perhaps the author is only a trifle enthusiastic when he suggests in quoting Mr. Harris of Australia that the "price paid to the farmer varied according to the quality and condition of his grain." The actual efforts being made in some States to get local elevators to buy wheat on a rye-free, smut-free basis and pay a premium for protein in wheat, do not suggest that the time for utter repose for the farmer or the elevator man has yet come even in the case of our well-laid-out grading system.

Even less convincing is the author's attack on the old question of the profitableness of withholding grain from the market at certain seasons of the year. The objective in this argument is plainly to prove "that dumping of

immense supplies of grain on the market does not break the price.'' The proposition is proven by the orthodox statistical trick of a 20- or 30-year average. In this the author falls into a too-common error of attributing too much reality to the hypothetical case set up in a general average. The misleading nature of such a general average in relation to any policy of action is apparent even in data as well presented as those of Pope in ''The Holding Movement in Agriculture'' appearing in Economic Essays in honor of John Bates Clark. The whole difficulty is that the trick demonstrates what a random selection of figures will do when treated statistically but by their very nature tell very little about what is the economic thing for the farmer to do. For instance, in the essay referred to above it is shown that from 1903-04 to 1912-13 there was no money in holding wheat. It so happens that this 10-year average selected at random contains five years when at Kansas City low No. 2 hard winter wheat prices tended generally upward from July. In the other five years the general price tendency was downward. All the average proves is that the ups about equal the downs. With such an hypothesis, resort must be made to one of the bed-time stories of economics to conclude that farmers would be just as well off if every last one of them sold every bushel of his wheat right after harvest in July or August. Criticism of judgment is warranted not so much by the making of mud pies as by the eating of them. What the data really show is that prices are high early in the season part of the time and the other part of the time, low. Prices average as high as they do early in the season only with average seasonal distribution of receipts. Average data do not show what the result would be if any decided shift in seasonal distribution of receipts were made.

But even weaker economic reasoning appears in the author's attempt to explode the theory of orderly marketing by comparing daily market receipts and prices. In the first place, many of the graphs used are so constructed in the scaling of prices and receipts as to emphasize fluctuations in receipts and minimize fluctuations in prices. The result is little more than graphic trickery. In the second place, conclusions are drawn much broader than the data presented warrant. As an example, take the case of wheat at Chicago: ''Of the four peak days of Chicago receipts, one day showed no change in price, one day a drop in price and two days a rise in price. These figures indicate, therefore, that daily receipts at the market have little, if any, effect on the price; also that the month's receipts of domestic terminals have likewise little or nothing to do with the price.'' The data merely showed that receipts were not the determining factor in price *every day*. The author's own figure 4 shows that while the trend of receipts at Chicago from July to August were up the trend of Chicago wheat prices was down.

Kansas City receipts in July, 1924, the year referred to by the author, were 14,615 cars, by far the largest July receipts of any of the previous 10 years. August receipts were 17,553 cars, an exceptionally heavy run. No. 2 hard winter wheat at Kansas City quoted at $1.24 to $1.41 July 26, declined to $1.10 to $1.24 by August 27. The Kansas City Grain Market Review reported on certain days as follows:

July 28.—''The largest receipts on record reached Kansas City today and

coming in conjunction with a weak future market served to depress hard and dark hard quotations 1 to 4 cents, with a further loss in premiums.''

Discussing the futures market for this day the report says:

''A reactionary tendency developed in wheat future prices early today as a result of better Canadian weather, disappointing cables and enormous receipts of winter wheat.''

July 29.—''A downturn in futures and further liberal receipts kept cash wheat prices weak in today's local market.''

August 18.—''Demand continued good but the arrivals were again heavy and more than ample to fill requirements.''

And so one might multiply instances that challenge the general conclusion of the author that receipts at the market have little effect on prices.

''Shall We Change Our Grain Marketing System'' hardly measures up to what would be expected of a report by an economist to superiors in a business organization for their own guidance For this reason the bulletin savors more of the artful pleading of a case than of the careful proving of one.

R. M. Green

Kansas State Agricultural College

Economics of Farm Organization and Management, by Clarence L. Holmes. New York: Heath. 1928. Pp. xvi, 422.

Workers in the field of Farm Management will read this book with interest not only because of the content of the book itself, but because it is published as the first volume in the Heath Rural Commerce and Administration series which will be edited by Dr. E. G. Nourse of the Institute of Economics, Washington, D.C.

As stated in the Foreword, this book represents a departure from most texts in the farm management field in that it is designed as an ''introductory text based on general principles'' which underlie the farm management field. It is the author's suggestion that a course based on this text should be followed by a second course dealing with the ''external economic conditions and forces with which the farmer has to deal.'' This second course would resemble the usual college course in the elements of economics presented in terms of the agricultural industry.

Perhaps this book may be looked upon as the first systematic treatment, strictly from the point of view of economics, of the problems of farm proprietorship,—that is, the business organization of the farm. It treats of private economics in terms of farm entrepreneurship, rather than of collective economics; and it tries to show the relation of farm technique to the economic problem of farm proprietorship.

Part I, consisting of four chapters, is devoted to the economics of farm organization and management and contains a simple presentation of a few economic concepts designed to orient the student to the approach given to the subject in this text. This is well illustrated by the outline of the field of agricultural economics which the author has divided into two parts, the collective aspects and the individual aspects. The latter is subdivided under the heads of (1) Business Administration or private economy (organization and management) of farms and of farmers' organizations; and (2) Aids

to Control, including statistics, accounting, and economic information. The discussion of economic specialization in agriculture leads directly into the discussion of types of farming.

Part II, Farm Organization, takes up the organization of the farm business and in keeping with the general economic approach to the problem discusses the factors of production in a somewhat orthodox manner. The discussion within this section of the selection and combination of factors of farm production sets forth the proportioning of the factors of production and differential productivity in the most adequately developed form yet prepared in a farm management text. This section closes with a discussion of the nature of farming costs and the farmer's profits.

Part III, Farm Management, discusses briefly the function of the manager in operating the farm;—in buying and selling, as a technical expert in production, and in the control and direction of farm labor.

The title of the book, "Economics of Farm Organization and Management," was evidently selected by the author to convey the same idea expressed by others in the farm management field by the term "Farm Organization and Operation." Whether or not organization as well as operation is a function of management is a question that might be asked. The title "Economics of Farm Management" or "Economics of Farm Organization and Operation" would seem to have been more in line with business phraseology.

Revisions of this book doubtless will see some changes in proportioning the discussion of the various subjects treated. The section on farm organization, for example, while treating of the nature of farming costs, seems rather inadequate from the standpoint of the part that cost studies have played in the development of the subject during the past twenty-five years. The brief discussion on the history of farm cost study, while setting forth the early objectives of cost investigations, would seem to treat the subject more adequately if it included in the discussion the objectives of cost studies that have more recently been stated by the recognized pioneers in the field. This might have been done by setting forth such pronouncements as that of Professor Boss (American Farm Economic Association, 1925) or that of Dr. Taylor (American Farm Economic Association, 1922).

If we are to assume that few, if any, additional agricultural economic courses are to be required of the general agricultural student besides the two suggested by the author, the question may logically be raised as to whether the author might not have given further discussion to research methods and to a practical consideration of the farmer's best means of studying and analyzing his business. Perhaps comments should be withheld until additional books in the series are off the press; however, after reading this text the reviewer has the feeling that the student will not find answered to his satisfaction such problems as the following: How far should the land buyer encumber himself? How safeguard his interests in selecting a farm? What records should he keep? How analyze his business? These and other practical problems have occupied a prominent place in much of our farm management teaching because the majority of the students have expected to be farmers or to instruct or advise farmers of the future. Much practical information may be supplied by the instructor in supplementing this text if

he has adequate research materials at his command, but where the local research program is not well developed it may be difficult for the instructor to do this.

Professor Holmes has placed at our disposal an excellent text, and farm management workers generally should welcome this further introduction of economic concepts into the field of farm management, but in teaching economic principles the reviewer feels that the instructor of undergraduates must use care in retaining the practical contributions already made for the successful organization and operation of farms which have justified farm management teaching and research in the eyes of many farmers.

University of Illinois *H. C. M. Case*

Cooperative Marketing of Grain in Western Canada, by J. F. Booth. Washington: United States Department of Agriculture. Technical Bulletin No. 63. January, 1928.

American farmers and students of agricultural conditions have had access to much literature concerning the Canadian wheat pools, but the majority of it has been furnished by the propaganda departments of the wheat pools themselves or by propagandists who oppose the extension of large-scale grain marketing.

After telling the entertaining story of the cooperative grain marketing experiments in western Canada (pp. 1-48), Dr. Booth analyzes pool methods and achievements. It is interesting to observe that the pools used the facilities of the Grain Exchange, although direct sales to domestic mills plus those made through branch offices and agencies have amounted in recent years to about 75 per cent of the total grain sold by the pool (p. 55). Referring to the functions of assembling, shipping, and exporting, the author states that "the wheat pool . . . . unites in one organization all of the operations represented in the assembling, shipment, and sale of grain, domestic and export." (p. 55)

In regard to orderly marketing, there was no thought among "those responsible for administrative policies [of distributing sales] with perfect uniformity throughout the year." On this point, a chart is presented which compares the monthly percentage of wheat marketings prior to the organization of the pool to the monthly percentages marketed by the pool, and the wheat marketings by the pool are seen to be more evenly distributed throughout the year (p. 57). This does not mean that the wheat is moved from the country elevators to the terminals differently than before, because the pools present organizations have attained is due in large measure to this principle of cooperation and to the accumulated experiences of nearly thirty years in cooperative grain marketing." (p. 98)

The technical make-up of the bulletin permits ready reference. There are statistical tables and charts, but they are presented with discrimination. The reader will feel that he is obtaining an accurate picture of the cooperative grain marketing movement in Canada and he will feel also that the material presented is free from bias.

Jos. G. Knapp

Institute of Economics.

encourage members to ship the grain to the terminals so that it may be in a salable position as soon as possible (p. 59).

The mooted question of pool versus non-pool prices is lightly skipped over. The author contents himself with showing how difficult and unreliable such comparisons usually are "because of the inadequacy of satisfactory data. It is believed, therefore, that comparisons between pool and non-pool prices at present have little, if any, value." (p. 62) Similarly, at a later point, Dr. Booth cautions against the free use of cost comparisons. "Comparisons are sometimes made between costs as presented here [for Canadian pools] and the cost per bushel incurred by some of the wheat pools in the United States. Persons who make such comparisons would do well to recognize the differences in methods of arriving at such costs and in items included.

The progress of the pools is shown statistically. There were 140,208 members as of March 15, 1927, and the volume of pooled grain operations for the 1926 crop was 176,567,000 bushels of wheat and 20,575,000 bushels of coarse grains (p. 87). The methods of handling this large volume of grain both in receiving the grain from the pool member and in merchandizing by the terminal elevators is carefully described (pp. 67 ff). Dr. Booth reports 582 pool-controlled elevators in Saskatchewan, 40 in Manitoba, and 42 in Alberta for the year 1926-27 (p. 74). (At the present time the number of such pool elevators is approximately 925.)

With this detailed exposition of the growth and operation of the Canadian wheat pools, the author is ready to turn to a comparison of cooperative grain marketing in the United States and Canada. He states that "whereas in the United States the local farmers' elevator is still the dominant organization, the development in Canada has been from local cooperative elevators to cooperative commission companies, then to cooperative line elevator companies, and finally to wheat pools controlling country and terminal facilities." [Contents of sentence transposed] (p. 93) It is shown that the conditions in the two countries have not been identical and that the marketing of the grain crop of the United States "presents more complexities, more in fact than are usually realized."

For example, "the marketing of wheat in the United States is made more difficult than in Canada by reason of the fact that purchases are made on the basis of protein content in addition to grade and other factors, whereas in Canada grade is the dominant factor in price determination." Then there are more varieties of wheat in the United States. There are different facilities for elevator operation. There are many crops competing for the land, while western Canada is largely a "one-crop" region (p. 94). The author however cautions against the assumption that a recital of differences implies that no improvements can be made in the United States.

The study concludes with a section "Canadian Experiences Demonstrate Value of Large-scale Cooperatives." The conclusion is reached "that the achievements of both cooperative elevator companies and the pools are due primarily to the fact that they have been organized in such a way as to coordinate the operation of country and terminal elevators with central selling agencies. This has put the farmers or companies in a position to compete successfully with private traders similarly organized. Whatever success the

BOOK NOTES

[This list and the notes have been prepared by Mr. Mendum, largely from books listed in "Agricultural Economic Literature," a mimeographed publication prepared in the Library of the Bureau of Agricultural Economics. The attempt has been to describe the books sufficently to indicate the nature of the material and the kind of interest readers may have in them.]

Mills, Frederick Cecil. *The behavior of prices.* With a foreword by Edwin F. Gay and Wesley C. Mitchell. New York: National bureau of economic research, inc., 1927. 598p. (Publications of the National bureau of economic research incorporated, no. 11.)

This study is a contribution in an interesting and vital field and goes a great way toward enhancing our knowledge of the characteristics of price fluctuations.

Dr. Mills presents the results of an elaborate analysis of the behavior of wholesale prices in the United States from 1890 to date, in which monthly and yearly commodity prices are treated individually and in combination, and in relation to general economic conditions.

This volume deals with:

1. "The behavior of prices of individual commodities, and the relations among different attributes of commodity prices.

2. Regional differences between commodity prices, and differences from market to market in the behavior of prices of individual commodities.

3. Certain problems related to the measurement of changes in the general level of wholesale prices.

4. The measurement and significance of price dispersion and of price displacement.

5. The effect of changes in the price level upon relations among the prices of individual commodities.

6. The characteristics of the population of prices, as revealed by the behavior, in combination, of price relatives and of measures of variability, trends and cyclical movements in the prices of individual commodities."—p. 438.

Most of the aspects the author has had to study and present by means of statistical measures which make this volume one that is not to be read lightly and hurriedly. The average reader without a statistical background will probably read with considerable interest the first half of the book and leave the second half for the more fully equipped.—From a review by L. H. Bean.

Seligman, Edwin R. A. *The economics of instalment selling; a study in consumers' credit, with special reference to the automobile.* New York and London: Harper and Brothers, Publishers, 1927. 2v.
Bibliography: v. 1, pp. 339-346.

Business men, statisticians, economic historians and theorists, and philosophers will all find food for thought in this timely study. Volume one is the text proper, containing all the important conclusions. Volume two is an appendix embodying the results of special statistical inquiries which are summarized in the first volume. Special attention is given to the automobile be-

cause it constitutes such a large and important part of all instalment sales and because much information was obtained about it through the courtesy of the General Motors Corporation.

"Summing up the entire matter, we should say that instalment selling, like every new institution, is subject to the perils of novelty. . . . . As the years roll by, experience will teach us to what classes of commodities and to what strata of society instalment selling is economically applicable. . . . . We may expect to learn that . . . . in its ultimate and refined forms, instalment credit will be recognized as constituting a significant and valuable contribution to modern economy."—From a review by Arthur N. Moore.

Sorokin, Pitirim. *Contemporary sociological theories.* New York and London: Harper & Brothers, 1928. 785p. (Harper's social science series, F. S. Chapin, editor.)

The author, who is Professor of Sociology at the University of Minnesota, gives in the introduction the object of his book. It is as follows: "This book deals with the sociological theories of the last sixty or seventy years . . . . with the character and the validity of the theories, but does not deal with their authors."

He gives three reasons for writing and publishing the book: first, there is no single book "which gives a concise survey of all the principal sociological theories of the period mentioned"; second, "the field of sociology has grown to such an extent that for a sociologist who is devoted to a study of a special sociological problem, it is extremely difficult to have an adequate knowledge of the whole field of the science . . . . [and] he does not have time to go through the hundreds of various sources where information about the theories is given"; third, "the field of sociology is overcrowded by a multitude of various and contradictory systems. . . . . One of the most urgent tasks of the contemporary sociologist is to separate what is really valid from that which is false or unproved in these theories. Such a separation is likely to be as necessary as the setting forth of a new hypothesis. Providing that is done carefully, a critical analysis of the contemporary sociological theories may be of real service to the science of sociology. This task is attempted in the book and is its primary purpose."

Duncan, Ralph E. *The state in business; what it has meant to South Dakota . . . .* a series of articles published in the New York commercial June-September, 1926. (New York City, New York commercial [1926]) 63p.

Twenty-five articles are here reprinted. Among them are: The Rural Credit Bubble, State Hail Insurance System, The Collapse of State Finances, The Public Debt and Taxation, and The Farmer Pays the Bill.

RECENT STATE PUBLICATIONS

Compiled by MARY F. CARPENTER, Library, Bureau of Agricultural Economics
U. S. Department of Agriculture

CALIFORNIA

California. Dept. of Agriculture, Sacramento. Monthly bulletin, v. 17, no. 2, February, 1928.

Contains the proceedings of the sixtieth convention of fruit growers and farmers, Stockton, California, Nov. 16-17, 1927.

California. Dept. of Agriculture, Sacramento. Monthly bulletin, v. 17, no. 3, March, 1928.

Pages 216-221 contain an article by H. W. Poulsen on Unusual Vegetables Grown in California. The vegetables discussed are sweet anise, Italian sprouting broccoli and cardoon. Directions for and illustrations of methods of packing for shipment are given.

California. Dept. of agriculture, Sacramento. Dairy laws of California with regulations for their enforcement. Revised to Oct. 1, 1927. (Special publication, 78. 1927. 69p.)

California. University. College of agriculture. Agricultural extension service, Berkeley. The agricultural situation in California. (Circ. 18. 1928. 30p.)

Jones, H. A., and Robbins, W. W. The asparagus industry in California. Calif. Agr. Exp. Sta., Berkeley. Bul. 446. 1928. 105p.)

Pages 76-84 discuss sorting, grading and packing for market, with illustrations; and pages 84-88, the canning industry.

Rauchenstein, Emil. Economic aspects of the watermelon industry. (Calif. Agr. Exp. Sta., Berkeley. Bul. 449. 1928. 26p.)

COLORADO

Burdick, R. T., Reinholt, Martin, and Klemmedson, G. S. A study of ranch organization in eastern Colorado. (Colo. Agr. Exp. Sta., Fort Collins. Bul. 327. 1928. 61p.)

Results of a study extending through the years 1922-1925 in cooperation with the U. S. Department of Agriculture.

Colorado. Agricultural experiment station, Fort Collins. Fortieth annual report . . . . for the year 1927. 53p.

Report of the agricultural economist: pp. 32-37.

CONNECTICUT

Wilkinson, A. E. Tomatoes. (Conn. Agr. Ext. Service, Storrs. Ext. Bul. 120. 1928. 22p.)

Marketing phases and costs of growing are given on pages 17 to 21.

FLORIDA

McKinley, Bruce. An economic study of potato farming in the Hastings area for the crop year 1925. (Fla. Agr. Exp. Sta., Gainesville. Bul. 193. 1928. pp. 172-275.)

"The study was made to find out the farm practices, materials used, profits made, and to compile this information in such form as to make it helpful to farmers."

GEORGIA

Middleton, R. M. Marketing Georgia peaches. (Ga. Agr. Exp. Sta., Experiment. Circ. 82. 1928. 4p.)

IDAHO

Wells, C. F. The potato situation in Idaho for 1928. (Idaho. Agr. Exp. Sta., Moscow. Circ. 51. 1928. 8p.)

ILLINOIS

Case, H. C. M., and Ross, R. C. The place of hog production in corn-belt farming. (Ill. Agr. Exp. Sta., Urbana. Bul. 301. 1927. pp. 146-179.)

Pt. 1. Cost of producing hogs. Pt. 2. Factors to consider in fitting the hog enterprise to the individual farm. Pt. 3. Hog production a means of adjusting sale of farm products to market conditions.

Illinois. University. College of agriculture, Urbana. The agricultural outlook for Illinois, 1928. 10p. Mimeographed.

INDIANA

Indiana. Agricultural experiment station, West Lafayette. Annual crop summary. 1927. (Ind. Crops and Livestock, no. 27. 1927. 15p.)

Indiana. Agricultural experiment station, West Lafayette. Annual livestock summary, 1928. (Ind. Crops and Livestock, no. 29. 1928. 14p.)

Indiana. Agricultural experiment station, West Lafayette. Assessors' enumeration of 1926 crops. (Ind. Crops and Livestock, no. 28. 1928. 12p.)

The three reports above were issued in co-operation with the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, U. S. Department of Agriculture.

IOWA

Holmes, C. L. The Iowa agricultural outlook for 1928. (Iowa. Agr. Exp. Sta., Ames. Current economic series. Report 7. 1928. 16p.)

Holmes, C. L. and Allbaugh, L. G. Summary of Iowa agricultural outlook for 1928. (Iowa State Col. of Agr. and Mech. Arts. Ext. Dept., Ames. Spec. bul. 1928. 4p.)

Iowa. Agricultural experiment station, Ames. Annual report for fiscal year ending June 30, 1927. 63p.

Problems in agricultural economics and farm management studied during the year, pp. 6-9, projects in progress, p. 43.

KANSAS

Barnett, R. J. Grape growing in Kansas. (Kan. Agr. Exp. Sta., Manhattan. Circ. 134. 1928. 32p.)

Includes names of varieties for commercial use, cost of trellises, harvesting and packing.

Kansas. State board of agriculture, Topeka. Report [quarterly] v. 47, no. 185-A, March, 1928. 107p.

Contains the addresses, papers and discussions at the Board's fifty-seventh annual meeting, January 11-13, 1928, including the following: The farmer as a business man, by C. E. Huff.—A view of the livestock situation, by V. H. Munnecke.—The wheat-belt program, by E. H. Hodgson.

MICHIGAN

Gardner, V. R. Varieties and locations as factors in apple production. (Mich. Agr. Col. Ext. Div., East Lansing. Ext. bul. 65. 1928. 4p.)

A condensation of a study presented in detailed form in special Bulletin 161 of the Michigan Agricultural Experiment Station.

Michigan. Agricultural experiment station, East Lansing. Quarterly bulletin, v. 10, no. 3, Feb., 1928. pp. 79-146.

The combine harvester operated in Michigan (Costs of harvesting with combine), pp. 82-86.

Newton, R. W. and Hedrick, W. O. Farm real estate assessment practices in Michigan. (Mich. Agr. Exp. Sta., East Lansing. Spec. bul. 172. 1928. 80p.)

Contents: The statutory law of assessment and equalization.—Assessment law as interpreted by the State Supreme Court.—Assessment in practice.—Equalization in practice.—The function of the State Tax Commission.—Recommendations for tax reform.—Appendix: Summary of farm real estate assessment procedure in the United States.

MINNESOTA

Anderson, P. A. Growing and marketing wool. (Minn. Univ. Dept. of Agr. Ext. Div., Univ. Farm. Spec. bul. 117. 1928. 14p.)

Contains general information for the wool grower.

MISSOURI

Morgan, E. L. and Burt, H. J. Community relations of rural young people. (Mo. Agr. Exp. Sta., Columbia. Research bul. 110. 1927. 77p.)

In co-operation with the Bureau of Agricultural Economics, U. S. Dept. of Agriculture.

MONTANA

Bell, E. J., Jr. Markets for farm products of the Billings trade area. (Mont. Agr. Exp. Sta., Bozeman. Bul. 212. Jan., 1928. 47p.)

An analysis of the production and trade in agricultural commodities in the area.

Montana. College of agriculture and mechanic arts. Extension service, Bozeman. Montana agricultural outlook for 1928. (Emergency leaflet 2, 1928. 8p.)

NEW HAMPSHIRE

New Hampshire. Agricultural experiment station, Durham. Agricultural experiments, 1927. Annual report of the director (Bul. 232. 1928. 35p.)

Projects include: Labor requirements of orchards; studies of grain costs; cost of producing potatoes; the White Mountain hotel market for vegetables and poultry; a study of roadside markets; the market price of broilers.

NEW JERSEY

Oley, R. C. Prices of New Jersey farm products. (N.J. Dept. of Agr., Trenton. Circ. 132. 1927. 32p.)

Waller, A. G. and Weiss, H. B. The poultry industry in New Jersey. A statistical and economic study. (N.J. Agr. Exp. Sta., New Brunswick. Bul. 457. 1927. 48p.)

NEW MEXICO

New Mexico. Agricultural experiment station, State College. Thirty-eighth annual report. 1926-27. 79p.

Agricultural economic projects are reported on pp. 74 to 78.

NEW YORK

Collingwood, G. H., Cope, J. A., and Rasmussen, M. P. The production of maple syrup and sugar in New York state. (Cornell Univ. Col. of Agr. Ext. Service, Ithaca. Ext. bul. 167. 1928. 76p.)

Includes results of cost of production studies made during the years 1921-1923.

Corbett, R. B. An economic study of certain phases of fruit marketing in western New York. (N.Y. Cornell. Agr. Exp. Sta., Ithaca. Bul. 464. 1928. 51p.)

The first half is devoted to costs of packing fruit in the co-operative packing houses in western New York in 1922 and 1923, and the remainder contains data on the costs of packing fruit on farms, prices, and a statistical appendix.

Ladd, C. E. The farm horse situation in New York state. (Cornell Univ. Col. of Agr. Ext. Service, Ithaca. Bul. 169. 1928. 26p.)

"The data . . . . were obtained from 2,961 farms scattered throughout all the agricultural counties of New York."

"If history repeats itself, a shortage of young horses will develop within the next few years and prices of work horses will increase very materially."

Sanderson, Dwight. A population study of three townships in Cortland County, New York. (N.Y. Cornell. Agr. Exp. Sta., Ithaca. Memoir 111. 1928. 19p.)

Contains data showing the differences between the farm and the village population.

Sanderson, Dwight. A survey of sickness in rural areas in Cortland County, New York. (N.Y. Cornell. Agr. Exp. Sta., Ithaca. Memoir 112. 1928. 27p.)

NORTH DAKOTA

Barton, O. A. Turkey investigations in dressing shrinkages. (N.D. Agr. Exp. Sta., Fargo. Circ. 36. 1928. 12p.)

Benton, A. H. Poultry and egg marketing in North Dakota. (N.D. Agr. Exp. Sta., Fargo. Bul. 215. 1928. 38p.)

The North Dakota egg law and rules and regulations governing licensed egg dealers are contained in the appendices.

North Dakota agri. college, Extension Division, Fargo. The North Dakota agricultural highway as determined by the farmers of the state at the economic conferences held during February, 1928. (Cir. 81. April, 1928.)

Willson, E. A., Hoffsommer, H. C. and Benton, A. H. Rural changes in western North Dakota. Social and economic factors involved in the changes in number of farms and movement of settlers from farms. (N.D. Agr. Exp. Sta., Fargo. Bul. 214. 1928. 110p.)

OHIO

Hauck, C. W. The apple industry of Ohio. (Ohio. Agr. Exp. Sta., Wooster. Bul. 418. 1928. 70p.)

Information and statistics have been assembled relating to the production and marketing phases of the industry.

Ohio. Agricultural experiment station, Wooster. Forty-sixth annual report for 1926-27. (Bul. 417. 1928. 118p.)

The Report of Rural Economics is given on pp. 77-81. It includes: Cost of cultivating corn in different sized fields; Season of egg production as related to profits; Livestock loss at Cleveland stock yards; Farm real estate taxes; Movement of rural population; Costs of family living.

Pages 82-83 contain a report on the project of the combine-harvester by the Engineering (agricultural) Division.

Ohio. Agricultural experiment station, Wooster. Bimonthly bulletin, March-April, 1928. v. 13, no. 2.

Partial contents: Spraying a young orchard—cost of labor and material, by C. W. Ellenwood.—Truck movement of Ohio apples, by C. W. Hauck.—An index of Ohio's gross cash income from agriculture, by V. R. Wertz.—Corn-hog ratio in Ohio, by C. R. Arnold.

OKLAHOMA

Fetrow, W. W. The farmer's part in co-operative marketing. (Okla. Agr. Exp. Sta., Stillwater. Bul. 174. 1928. 23p.)

"The data for this study were secured . . . . in . . . . sections of the cotton belt of Oklahoma."

PENNSYLVANIA

Bartlett, R. W. and Gregg, W. E. Milk marketing in Pennsylvania. (Pa. Agr. Exp. Sta., State College. Bul. 219. 1928. 43p.)

"An economic analysis of plant operation based on a study of the record of 52 shipping stations in 1925."

Mack, W. B. Early cabbage. (Pa. Agr. Exp. Sta., State College. Bul. 221. 1928. 22p.)

Shipments, commercial producing areas, types and varieties are contained on pp. 3-6; marketing on p. 21.

Taylor P. R. and Hanemann, H. A. Direct marketing of farm products in Pennsylvania. (Pa. Dept. of Agr., Harrisburg. Gen. bul. 454. 1927. 35p.)

Discusses the development of markets and the types and costs of direct marketing.

SOUTH CAROLINA

Hamilton, R. W. The cotton contest—1927, for better yield and staple value. (Clemson Agr. Col., Clemson College. Ext. Service. Circ. 94. 1928. 15p.)

Results of the second contest by farmers of the state in which one of the requirements was "That accurate records be kept by the contestant of all labor and material costs."

Jensen, W. C. and Russell, B. A. Studies of farm land prices and ownership (S.C. Agr. Exp. Sta., Clemson College. Bul. 247. 1928. 50p.)

The study was made in Anderson County, "A representative cotton area of the Piedmont region."

The sources of evidence used were: analysis of 10,051 deeds, covering a period from the early part of the nineteenth century up to 1927, for the price series; analysis of 185 deeds and 167 mortgages for tracing recent changes; use of 694 farm management surveys; interviews with merchants and real estate men.

TENNESSEE

Allred, C. E. and Atkins, S. W. An economic analysis of farming in Overton County, Tennessee. (Tenn. Agr. Exp. Sta., Knoxville. Agr. Econ. Survey, no. 1. 1927. 127p.) Mimeographed.

TEXAS

Crawford, G. L. Services, facilities, and costs of marketing vegetables in the lower Rio Grande Valley of Texas. (Tex. Agr. Exp. Sta., College Station. Bul. 378. 1928. 39p.)

Gabbard, L. P. Texas agricultural outlook for 1928. (Tex. Agr. Exp. Sta., College Station. Circ. 51. 1928. 20p.)

Texas. Commissioner of Agriculture. Twentieth annual report . . . . for the fiscal year . . . . ending August 31, 1927.

Includes reports of the statistical, cotton gin, warehouse, and market divisions.

VERMONT

Ellenberger, H. B. and Aplin, R. D. Returns for skim milk fed to hogs under Vermont conditions. (Vt. Agr. Exp. Sta., Burlington. Bul. 273. 1927. 15p.)

"The Vermont farmer wants to know not how much grain will be

saved by feeding skim milk, but how much money will be left him for his skim milk after he has paid all the other expenses of raising hogs.''

VIRGINIA

Virginia. Dept. of agriculture and immigration, Richmond. Bulletin 243. 1928. 32p.

Leaf tobacco sales for January, 1927-1928 are given by the Division of Agricultural Statistics on pages 25-27.

WASHINGTON

Severance, George, and Johnson, N. W. Production and marketing of Spokane Valley farm products. (Wash. Agr. Exp. Sta., Pullman. Bul. 221. 1927. 61p.)

Gives the results of a survey of the records of 113 farmers, the organizations of five profitable and five unprofitable farms, cost of production tables and the marketing situation.

Washington. Agricultural experiment station, Pullman. Thirty-seventh annual report June 30, 1927. (Bul. 222. 1927. 79p.)

Report of Division of Farm Management and Agricultural Economics, pp. 30-33.

WISCONSIN

McNall, P. E., Kifer, R. S. and Mitchell, D. R. Planning the farm for profits. (Wis. Agr. Exp. Sta., Madison. Bul. 395. 1927. 24p.)

A study of farms in Fond du Lac and Walworth Counties.

Wisconsin. Dept. of agriculture. Division of agricultural statistics. Madison. The farm outlook for 1928. (Wis. Crop and Livestock Reporter, v. 7, no. 2, Mar., 1928. pp. 5-8.)

Includes tables of monthly milk prices, 1919-1927, number and value of livestock, 1926-1927, and monthly livestock prices, 1926-1927.

PUBLICATIONS FROM THE BUREAU OF AGRICULTURAL ECONOMICS[1]

Issued March 19-June 9, 1928

TECHNICAL BULLETINS

37 Agricultural Survey of Europe: France. By L. G. Michael.

Fourth of a series of monographs on agricultural conditions in foreign countries, this one on France explains the developments of the war period and the years before and after, for all the important commodities. Not light reading for an afternoon but as interesting as a source of detailed information is likely to be. The student's work in later years has been very much simplified by the painstaking search and verification of data available through 1925.

45 A study of ranch organization and methods of range-cattle production in the northern Great Plains Region, by M. L. Wilson, R. H. Wilcox, G. S. Klemmedson, and V. V. Parr.

The authors have brought together much information of a general character to use in interpreting the findings of a survey of 304 ranches for the year beginning April 1, 1924, the various phases of which take most of the space. The industry was found to be in a more or less disorganized condition even in 1927, and some standard organizations are offered with a view to improvement.

50 Factors affecting the price of cotton, by Bradford B. Smith.

Contains a non-technical discussion as well as the detailed statistical analysis and tables necessary to develop the argument. "It seems to have been reasonably demonstrated that the price of cotton, to a surprising degree, can be statistically explained as the reflection of a few selected fundamental factors, or of others correlated with these factors."

70 The combined harvester-thresher in the Great Plains, by L. A. Reynoldson, R. S. Kifer, J. H. Martin, and W. R. Humphries.

A complete report of a survey made in 1926 some phases of which were published a year ago.

71 A simple method for determining the oil content of seeds and other oil-bearing materials, by D. A. Coleman and H. C. Fellows.

By thorough grinding and mixing with a solvent in proper proportions worked out beforehand the oil content of seeds may be ascertained with accuracy close to that of the standard ether-extract method in about 15 minutes. This means much to the trade and to converters of these materials.

FARMERS' BULLETINS

1558 Preparation of eastern grapes for market, by B. E. Shaffer.

California production and shipments of juice grapes have so greatly

[1] Mimeographed preliminary reports and periodicals are not listed on account of the limited number of copies available for distribution. Notes by S. W. Mendum.

increased that eastern growers need to get busy if they are to retain their natural advantage in the table-grape field. This bulletin goes over the more important points of practice.

1559 Rural libraries, by W. C. Nason.

Discusses rural library service, with specific examples. One gets the idea that rural libraries are realities in some places, through the efforts of a few hard-working souls who thought about the "oughts" and set about making them "is's." Also that the pleasure and inspiration spread by these small collections of books cannot be measured by the counts of books loaned in comparison with the statistics from the libraries of large cities.

1565. Shall I buy a combine? by L. A. Reynoldson, J. H. Martin, and W. R. Humphries.

Assembles the arguments pro and con, with particular attention to those unfavorable criticisms that have been laid down against these machines. The authors leave the reader with the impression that the machines are about all right if they are not expected to do what they obviously cannot do or what no other method would do any better. The chief difficulty is with the first cost, entailing high overhead charges, which require distribution over large acreages if the acre and bushel costs are to be reduced.

MISCELLANEOUS PUBLICATIONS

Handbook of dairy statistics, by T. R. Pirtle.

An attractive compilation of data for the use of all factors in the industry, but to the trade factors rather than to milk producers. A revision of the earlier handbook which has been out of print for many months.

Correlation of kernel texture, test weight per bushel, and protein content in hard red spring wheat, by J. H. Shollenberger, and C. F. Kyle. (Reprint from *Journal of Agricultural Research*, vol. 35, no. 12, Dec. 15, 1927.)

Rules and regulations governing inspection of hay and straw (S.R.A. 110).

CANDIDATES FOR THE DOCTOR'S DEGREE IN AGRICULTURAL ECONOMICS IN AMERICAN UNIVERSITIES AND COLLEGES 1928-29

The name shown in parenthesis is that of the university at which the degree is sought. The date indicates the probable time of completion.

Alvord, B. F.—B.S., Illinois, 1923; M.S., Illinois, 1924; "Shifts in Agricultural Production in the Red River Valley in Minnesota," (*Minnesota*, 1929.)

Andrews, J. B.—B.S., Illinois, 1913; M.S., Illinois, 1927; (Not Determined.) (*Illinois.*)

Armentrout, W. W.—B.S.A., Tennessee, 1916; M.A., Wisconsin, 1925; "Economic Aspects of County Livestock Shipping Organization." (*Minnesota*, 1929.)

Armenson, E.—B.S., Wisconsin, 1925; M.S., Ohio, 1927; "The Truck as a Factor in Marketing Ohio Livestock." (*Ohio*, 1929.)

Ballinger, R. A.—B.S., Minnesota, 1924; M.A., Minnesota, 1925; "The Taxation of Agriculture in Minnesota." (*Minnesota*, 1929.)

Bartlett, R. W.—B.S., Cornell, 1922; M.S., Cornell, 1924; "Marketing Methods of Milk Producers Coöperative Organizations." (*Pennsylvania State*, 1928.)

Bausman, R. O.—B.S., Purdue, 1914; "The Tenantry System in the State of Delaware." (*Cornell*, 1929.)

Bayla, A.—B.S., University of Philippines, 1918; M.S., Wisconsin, 1928; (Not determined.) (*Wisconsin*, 1929.)

Bentley, R. C.—B.S., North Dakota State, 1923; M.S., North Dakota State, 1924; "A Regional Study of Iowa Farm Prices, Farm Disposal, and Utilization of Commercial Corn." (*Iowa State*)

Berg, H. A.—B.S., Illinois, 1922; M.S., Illinois, 1925; "Cost Accounts on Farms." (*Cornell*, 1930.)

Beyleveld, A. J.—B.Co., Stellenbosch, 1925; "Crop Reporting in Various Countries." (*Cornell*, 1928.)

Black, A. G.—B.S., Illinois, 1920; M.A., Minnesota, 1925; "Wealth and Income of the Farmers of the United States." (*Minnesota*, 1927.)

Bond, M. C.—B.S., Vermont, 1920; M.S., Vermont, 1927; "The Marketing of Milk through Ice Cream." (*Cornell*, 1928.)

Bottum, J. C.—B.S., South Dakota, 1926; M.S., Illinois, 1927; (Not determined.) (*Illinois*)

Boyd, H. B.—B.S.A., Saskatchewan, 1923; "Egg Marketing." (*Cornell*, 1929.)

Bryan, M. H.—A.B., Illinois, 1924; A.M., Illinois, 1925; "The Chicago Mercantile Exchange." (*Chicago*, 1929.)

Bucknam, R. F.—B.S., Cornell, 1914; "An Economic Study of Rural Electrification in New York State." (*Cornell*, 1929.)

Burke, A. D.—B.S., Wisconsin, 1915; M.S., Ohio, 1917; (Not determined.) (Ohio, 1930.)

Carncross, J. W.—B.Sc., Cornell, 1925; M.Sc., Rutgers, 1926; "Economic Factors of Vegetable Growing in Central and Northern New Jersey." (*Rutgers*, 1929.)

Catherwood, M. P.—B.S., Illinois, 1926; M.S., Illinois, 1927; "A Farm Management Study of the New York Milk Shed." (*Cornell*, 1929.)

Chiu, A. K.—A.B., Boone University, China, 1921; (Not determined.) (*Harvard*, 1929.)

Comish, N. H.—B.S., Utah, 1911; M.S., Wisconsin, 1915; (Not determined.) (*Wisconsin*, 1928.)

Commons, J. A.—B.A., Wisconsin, 1925; "Management in Economic Theory and as the Significant Variable in Production." (*Wisconsin*, 1929.)

Cowan, D. R.—B.A., Queens, 1917; M.A., Toronto, 1918; "An Analysis of the Factors Determining the Territorial Distribution of the Sale of Dairy Produce." (*Minnesota*, 1929.)

Cox, R. W.—B.S., Illinois, 1914; M.S.A., Cornell, 1923; (Not determined.) (*Cornell*, 1930.)

Daugherty, M. M.—B.S., Texas A. & M., 1916; "Taxation of Farm Land in Delaware." (*Harvard*, 1929.)

Davis, J. G.—B.A., Bates, 1906; (Not determined.) *Harvard*, 1930.)

Drummond, W. M.—A.B., Queens, Ontario, 1923; (Not determined.) (*Harvard*, 1930.)

duPlessis, J. H.—A.B., Transvaal, 1925; "Marketing South African Oranges." (*Cornell*, 1929.)

Eastman, M. G.—B.S., New Hampshire, 1913; M.S.A., Cornell, 1916; "Roadside Markets in New Hampshire." (*Cornell*, 1928.)

Ebling, W. H.—B.S., Wisconsin, 1922; M.S., Wisconsin, 1926; (Not determined.) (*Wisconsin*, 1929.)

Ellis, L. S.—B.S., Wisconsin, 1922; (Not determined.) (*Wisconsin*, 1929.)

Ellsworth, V. T.—B.S., Utah, 1924; M.A., Utah, 1924; "Distribution of Control in Dairy Organizations." (*California*, 1930.)

Frame, B. H.—A.B., Missouri, 1924; A.M., Missouri, 1925; "Factors Determining Choice of Markets in the Marketing of Grain." (*Chicago*, 1929.)

Fuhriman, W. U.—B.S., Utah, 1925; "Methods of Determining Comparative Advantage." (*California*, 1929.)

Garey, L. F.—B.S., Nebraska, 1914; A.M., Nebraska, 1915; (Not determined.) (*Cornell*,)

Gilbert, C. W.—B.S., Cornell, 1916; M.S., Cornell, 1926; "An Economic Study of Tractors and Trucks on Farms in New York State." (*Cornell*, 1928.)

Gile, B. M.—B.A., Wisconsin, 1913; M.S., Minnesota, 1925; "The Agricultural Credit Situation in Minnesota." (*Minnesota*, 1927.)

Graue, E.—B.S., Cornell, 1924; "The Development of Manufacturing Industries in Relation to the Relatively Increased Demand for Agricultural Products and the Elasticity of that Demand." (*Cornell*, 1928.)

Grindley, T. W.—B.A., Alberta, 1923; B.S., Alberta, 1925; M.S., Minnesota, 1927; "The Effects of a Single-Crop Agriculture in Western Canada." (*Minnesota*, 1929.)

Guernsey, S. C.—B.S., Iowa State, 1909; M.S., Iowa State, 1912; "The Relation of the Supply of Hogs to Prices." (*Wisconsin*, 1928.)

Hamilton, H. G.—B.S.A.E., Florida, 1921; "The Marketing of Citrus Fruit." (*Cornell*, 1928.)

Hammar, C. H.—B.S., Minnesota, 1924; "The Valuation of the Cut-over Land of the Lake States." (*Minnesota*, 1929.)

Harper, F. H.—B.S., Maryland, 1921; M.S., North Carolina State, 1925; "Forecasting the Acreage, Yield and Price of Cotton." (*Maryland*, 1928.)

Hartman, S. C.—B.S., Ohio, 1910; M.S., Ohio, 1912; "The Development and the Status of the Trucking Business in the Muskingum Valley." (*Ohio*, 1929.)

Hendel, J.—B.S., Cornell, 1921; "Cash and Future Price of Wheat in the Minneapolis Market for Hard Spring Wheat." (*Minnesota*, 1928.)

Herrmann, O. W.—B.S., Nebraska, 1922; "What the Tariff on Agricultural Products Does for the Farmer." (*Wisconsin*, 1929.)

Hill, F. F.—B.S., Saskatchewan, 1923; "Appraisal of Farm Lands." (*Cornell*)

Hinrichs, A. F.—B.S., Minnesota, 1922; "A Study of the Economic Factors Producing Differences in the Organization of German Agriculture and the Agriculture of the Parts of the United States Having Similar Climatic Conditions." (*Minnesota*, 1929.)

Hobbs, S. M.—B.A., North Carolina, 1916; M.A., North Carolina, 1917; "North Carolina, Economic and Social." (*Wisconsin*, 1929.)

Holt, B. A.—B.A., Minnesota, 1920; M.A., Minnesota, 1922; "Analysis of Potato Price Differentials." (*Minnesota*, 1929.)

Horner, J. T.—A.B., Oklahoma, 1909; B.S., Oklahoma A. & M., 1916; "Coöperative Milk Marketing." (*Robert Brookings*, 1928.)

Hurd, E. B.—B.S., Minnesota, 1922; M.A., Minnesota, 1923; "Economics of Farming Types in Iowa with Historical, Geographical, and Personal Factors." (*Iowa State*, 1930.)

Jensen, E.—B.S., Royal Agr. College, Copenhagen, Denmark, 1916; (Not determined.) (*Harvard*, 1929.)

Jesness, O. B.—B.S.A., Minnesota, 1912; M.S., Minnesota, 1924; "The Marketing of Tobacco." (*Minnesota*, 1928.)

Johnson, E. C.—B.A., Minnesota, 1921; M.A., Minnesota, 1923; "An Analysis of the Agricultural Credit Situation in Kentucky." (*Minnesota*, 1928.)

Johnston, P. E.—B.S., Illinois, 1917; M.S., Illinois, 1926; (Not determined.) (*Illinois*, 1929.)

Kumlien, W. F.—B.A., Lawrence, 1911; M.S., Wisconsin, 1923; (Not determined.) (*Wisconsin*, 1930.)

Lee, H. K.—G.S., Imperial University of Tokyo, 1924; M.S., Kansas State, 1927; "History of the Land System in Korea." (*Wisconsin*, 1929.)

Lindsey, A. H.—B.S., Illinois, 1921; M.S., Iowa State, 1922; "Causes of the Growth of Land Values in Iowa." (*Iowa State*, 1929.)

Lininger, F. F.—B.S., Pennsylvania State, 1917; M.S., Cornell, 1926; "The Influence of the Philadelphia Marketing Plan on Milk Production and Distribution." (*Cornell*, 1928.)

Magleby, H. A.—A.B., George Washington, 1926; (Not determined.) (Maryland, 1930,)

Mahony, J. R.—B.A., Utah, 1918; (Not determined.) (Harvard, 1929.)

McCord, J. E.—B.S., Cornell, 1915; M.S., Cornell, 1920; "A Study of Farm Leases and Contracts in Pennsylvania." (*Pennsylvania State*, 1929.)

Meal, W. G.—B.S., Cornell, 1923; "Lettuce and Onion Production and Marketing." (*Cornell*, 1929.)

Menon, K. B.—A.B., Madras, India, 1918; A.M., California, 1923; "Economic Study of an Indian Village." (*California*, 1929.)

Merchant, C. H.—B.S., Cornell, 1920; M.S., Cornell, 1922; "Production and Marketing of Apples in Oxford County, Maine." (*Cornell*, 1928.)

Mereness, E. H.—B.S., Cornell, 1926; "Farm Management Study of Fifty-five Farm Businesses in Genesee County, New York." (*Cornell*, 1931.)

Minneman, P. G.—B.S., Ohio, 1925; "Large Land Holdings in Ohio." (*Ohio*, 1928.)

Morrish, R. W.—B.S., Purdue, 1920; "Organization of Fairs and Expositions." (*Chicago*, 1929.)

Murray, K. A. H.—B.S., Edinburgh, 1925; "Agricultural Prices in Great Britain." (Cornell, 1929.)

Neethling, J. C.—A.B., Transvaal, 1922; "An Economic Study of Dairy Farming in Chenango Valley, New York." (*Cornell*, 1928.)

Nelson, P.—B.S., Utah, 1920, M.A., Utah, 1924; (Not determined.) (*Illinois*, 1929.)

Neveling, C. H.—B.S.A., Stellenbosch, 1923; M.S., Cornell, 1928; (*Cornell*)

Powell, W.—A.B., Cornell, 1924; M.S., Cornell, 1925; "Study of Factors Affecting Costs of Operation of Retail Feed Stores." (*Cornell*, 1928.)

Rhoades, J.—B.S., Minnesota, 1918; M.S., Minnesota, 1920; "Factors Affecting the Prices of Beef Cattle." (*Minnesota*, 1929.)

Ross. R. C.—A.B., Monmouth, 1914; B.S., Illinois, 1923; M.S., Illinois, 1925; (Not determined.) (*Illinois*, 1930.)

Roth, W. J.—B.S., Colorado, 1916; B.S., Illinois, 1920; M.S., Illinois, 1922; "The Wheat Crop and Its Relation to the Development of Farming in the Spring Wheat Region," (*Minnesota*, 1928.)

Rowe, H. B.—B.S., Iowa State, 1923; "A Plan for Federating Farmers' Elevators in the Spring Wheat Area. (*Minnesota*, 1929.)

Schaars, M. A.—B.S., Wisconsin, 1924; M.S., Wisconsin, 1927; (Not determined.) (*Wisconsin*, 1930.)

Schmidt, S.—Resident Doctor (*Cornell.*)

Silcox, W. B.—B.S., Toronto, 1923; M.S., Iowa State, 1925; (Not determined.) (*Wisconsin*, 1929.)

Sprague, G. W.—B.S., Minnesota, 1926; M.S., Minnesota, 1926; "Economics of Decentralization of Poultry Killing and Dressing Industry." (*Minnesota*, 1930.)

Stephens, P. H.—B.S., Nebraska, 1920; M.S., Illinois, 1926; "The Degree and Relative Economic Influence of the Factors Determining the Success of Dairy Farms." (*Cornell*, 1928.)

Stoker, H. M.—B.S., Pretoria, 1927; "Textile Industry." (*Cornell*, 1930.)

Stout, W. B.—B.S., Ohio, 1924; "A Business Analysis of Ohio's Livestock Shipping Associations." (*Ohio*, 1930.)

Stover, H. J.—B.S., Cornell, 1926; (Not determined.) (*Cornell*, 1929.)

Tennant, J. L.—B.S.A., Toronto, 1913; M.S.A., Cornell, 1921; "The Economic Relationships between Roads and Agriculture in New York," (*Cornell*, 1928.)

Thompson, R. L.—B.S., Louisiana, 1922; M.S., Wisconsin, 1924; "Agricultural Credit Situation in Louisiana." (*Minnesota*, 1929.)

Thurston, M. F.—A.B., Cornell, 1909; "The Outlook for Market Hay in New York State." (*Cornell*, 1928.)

Tinley, J. M.—B.Econ., South Africa, 1923; "Marketing Flue-Cured Tobacco with special reference to the Operations of the Tobacco Growers Coöperative Association." (*Minnesota*, 1928.)

Trussell, B.—A.B., Texas, 1913; (Not determined.) (*Harvard*, 1930.)

Tucker, C. K.—B.S., Cornell, 1922; M.S., Cornell, 1925; "Country Milk Plants." (*Cornell*, 1928.)

Ulrey, O.—B.S., Illinois, 1923; "The Operation of Country Banks." (*Cornell*, 1929.)

van der Merwe, W. H.—B.S., Stellenbosch, 1926; (Not determined. *Minnesota*, 1930.)

Vaughan, L. M.—B.S., Cornell, 1923; "An Economic Study of Abandoned Farm Areas in the State of New York." (*Cornell*, 1928.)

Walker, W. P.—B.S., Maryland, 1921; M.S., Maryland, 1924; "Cost of Producing Sweet Corn, Tomatoes, and Peas in Maryland." (*Maryland*, 1929.)

Wallace, C. T.—B.S., Mississippi A. & M., 1923; History of Land Speculation and Land Booms." (*Wisconsin*, 1928.)

Warren, S. W.—B.S., Cornell, 1927; (Not determined.) (*Cornell*, 1930.)

Waugh, F. O.—B.S., Massachusetts, 1922; M.S., Rutgers, 1924; "Margins on Commodities in Retail Stores." (*Columbia*)

Weeks, D.—B.S., Nebraska, 1915; M.S., Nebraska, 1919; C.E., Nebraska, 1921; "Analysis of the Factors Affecting the Sales Price of Land in the Eleventh Federal Farm Loan District." (*California*, 1928.)

Wilcox, R. H.—B.S., Minnesota, 1915; M.S., Illinois, 1919; (Not determined.) (*Illinois*)

Wileden, A. F.—B.S., Wisconsin, 1924; M.S., Wisconsin, 1925; "Theory of Rural Community Organization." (*Wisconsin*, 1930.)

Wittwer, E.—B.S., Nevada, 1922; "Study of Relationships of Prices of Wheat, Flour, and Bread." (*Cornell*, 1929.)

Young, H. N.—B.S., Cornell, 1917; "The Economic Study of Bean Production and Marketing of Beans." (*Cornell*, 1931.)

CANDIDATES FOR THE MASTER'S DEGREE IN AGRICULTURAL ECONOMICS IN AMERICAN UNIVERSITIES AND COLLEGES 1928-29

The name shown in parenthesis is that of the university at which the degree is sought. The date indicates the probable time of completion.

Adams, C. S.—B.S., Pennsylvania State, 1914; (Not determined.) (*Pennsylvania State*)

Alexander, L. L.—B.S., Missouri, 1917; "The Dairy Possibilities of the Ozark Region." (*Wisconsin*, 1928.)

Allen, D. B.—B.S.A., Purdue, 1927; "A Study of Central Markets for Farm Products." (*Purdue*, 1928.)

Alt, L. R.—B.S., Kansas State, 1916; "A Study of Cash Wheat Premiums and Discounts." (*Kansas State*, 1928.)

Anderson, B. M.—B.S., Kansas State, 1916; "Sales Methods Followed by Coöperative Livestock Marketing Associations." (*Kansas State*, 1928.)

Anderson, Pearl E.—A.B., Cornell, 1924; (Not determined.) (*Cornell*, 1929.)

Anderson, S. A.—B.S., Illinois, 1926; "Farm Improvements and Machinery as Factors in Capital Investment and Cost of Operation of Illinois Farms." (*Illinois*, 1928.)

Anderson, W. R.—B.S.E., Iowa State Teachers' College, 1927; "The Growth and Status of Farm Tenancy in Minnesota with Suggestions as to Desirable Farm Leases." (*Minnesota*, 1928.)

Avery, P. C.—B.S.A., Tennessee, 1924; "A Study of the Farmers Market of Knoxville, Tennessee." (*Tennessee*, 1928.)

Bane, G. M.—B.S., Illinois, 1912; "Studies in Rural Standards of Living." "*Wisconsin*, 1928.)

Barber, J. W.—B.S., Idaho, 1920; "An Economic Survey of the Minidoka Area." (*Idaho*, 1928.)

Battler, K. V.—B.S., Ohio, 1927; "The Fluid Milk Area of Columbus, Ohio." (*Ohio*, 1929.)

Beaty, D. W.—"Analysis of the Price Differentials Between Grades of Butter." (*Iowa State*, 1928.)

Bell, E. W.—B.S., Pennsylvania State, 1926; "Dairy Farming Practices Responsible for Variations in Butter Fat Production on 138 Farms in Cabot and Marshfield." (*Vermont*, 1928.)

Betts, R. E.—B.S., Oklahoma A. & M., 1926; "A Business Study of Some Cotton Coöperatives." (*Oklahoma A. & M.*, 1928.)

Bhosale, Y. P.—B.A., Nebraska, 1927; "Some Aspects of Coöperative Marketing in India." (*Cornell*, 1928.)

Bidlack, S. F.—B.S., Pennsylvania State, 1927; (Not determined.) (*Pennsylvania State*)

Bisset, G. B.—B.S.A., Aberdeen, 1924; "A Study of Hog Production and Prices in the United Kingdom." (*Cornell*, 1928.)

Blaine, L. H.—A.B., Washington, 1925; "Chicago Milk Supply." (*Chicago*, 1928.)

Boals, G. H.—B.S., Whitman, 1926; "A Study of Index Numbers as Related to Oregon Agricultural Commodities." (*Oregon*, 1928.)

Botsford, W. E.—B.S., North Dakota, 1915; "An Economic Survey of Supervised and Unsupervised Tenantry." (*North Dakota*, 1928.)

Bowman, A. E.—B.S., Utah, 1908; (Not determined.) (*Wyoming*, 1929.)

Brightman, M. H.—B.S., Rhode Island State, 1920; "A Method of Determining Consumer Demand for Poultry Products." (*Pennsylvania State*, 1928.)

Brown, F. J.—B.S., Minnesota, 1915; (Not determined.) (*Minnesota*)

Brown, S.—B.S.A., Tennessee, 1928; "Standard of Living of Rural Groups in Tennessee." (*Tennessee*, 1929.)

Chen, C. T.—B.S., Shanghai, China, 1927; (Not determined.) (*Virginia Polytechnic*, 1929.)

Cherniak, J. S.—B.S., Syracuse, 1927; "Modern Milk Marketing Problems," (*Michigan State*, 1928.)

Chowdbury, D. P. R.—B.S., Calcutta, 1925; "Land Tenancy." (*Cornell*, 1928.)

Clark, E. F.—B.S., Massachusetts, 1915; (Not determined.) (*Cornell*)

Clark, W. N.—B.S., Wisconsin, 1915; (Not determined.) (*Wisconsin*, 1929.)

Clarke, G. B.—B.S., Minnesota, 1917; "Preliminary Study of the Relationships of the Price of the Various Corn Futures in Chicago Market from 1900-1926." (*Minnesota* 1928.)

Class, C. F.—B.S., Ohio, 1912; "The Radio as a Dynamometer of Market News." (*Ohio*, 1928.)

Cleland, S. B.—B.S., Minnesota, 1914; "Production Factors and Standards for Minnesota Agriculture." (*Minnesota*, 1929.)

Cleveland, W. A.—B.S., Massachusetts, 1915; "The Agriculture of McDonough County, Illinois," (*Cornell*, 1928.)

Cole, R. M.—B.S., Pennsylvania State, 1920; "A Study of the Negro Problem in a Rural Community." (*Pennsylvania State*, 1927.)

Collins, —B.S., Purdue, 1924; (Not determined.) (*Ohio*,)

Cooper, J. F.—B.S.A., Alabama Polytechnic, 1921; "Cost of Producing Beans in Florida." (*Florida*, 1929.)

Dale, D. C.—B.S., Pennsylvania State, 1918; (Not determined.) (*Pennsylvania State*, 1929.)

Dargan, E. P.—B.S., Mississippi, 1896; "Price Index of Farm Commodities in Arkansas. *Cornell*, 1928.)

Dizmang, O. K.—B.S., Kansas State, 1927; "Inspection in the Commodity Markets at Chicago." *Chicago*, 1928.)

Donovan, R. L.—B.S., Minnesota, 1909; "Farm Organization for Dairying." (*Minnesota*, 1930.)

Dow, G. F.—B.S., Maine, 1927; "An Economic Study of the Dairy Industry in Maine." (*Maine*, 1929.)

Drutzer, S.—A.B., Roumania, 1912; M.E., Berlin, 1918; "Government Aid for the American Farmer." (*Columbia*, 1928.)

Eckloff, E. C.—B.S., Minnesota, 1925; "Different Types of Price Quotations used in the South St. Paul Livestock Market." (*Minnesota*, 1929.)

Fanning, J. W.—B.S.A., Georgia, 1927; "A Study of the Economic Factors Influencing the Exodus of Negroes in Certain Counties in Middle Georgia." (*Georgia*, 1928.)

Fry, J. M.—B.S., Pennsylvania State, 1917; (Not determined.) (*Pennsylvania State*, 1929.)

Galloway, Z. L.—B.S., Kentucky, 1924; "Farm Organization in the Purchase Region of Western Kentucky." (*Kentucky*)

Gatlin, C. E.—B.S., Texas A. & M., 1926; "Factors Affecting the Production and Distribution of Wealth in a Typical Agricultural Community." (*Texas A. & M.*, 1928.)

Goodwin, W. I.—B.S., Massachusetts, 1918; "Competitive Status of Commercial Onion Industry in the Connecticut Valley." (*Massachusetts Agricultural*, 1930.)

Gray, W. T.—B.S., Nebraska, 1922; "Rural Opportunities for Child Development in the Great Plains Region of the United States." (*Wisconsin*, 1928.)

Gregg, W. E.—B.S., Ohio Northern, 1906; "Cost Analysis of Shipping Station Operations." (*Pennsylvania State*, 1928.)

Grinager, T.—B.S., Minnesota, 1924; "The Coöperative Marketing of Honey." (*Minnesota*, 1928.)

Hall, O. J.—B.S., Arkansas, 1925; "Marketing Arkansas Strawberries." (*Minnesota*, 1928.)

Hamrick, F. G.—B.S., Clemson College, 1927; "An Interpretation of the Farmers Movements in Terms of Price Levels." (*North Carolina State*, 1928.)

Harper, F. A.—B.S., Michigan, 1926; "Michigan Potato Prices." (*Cornell*, 1928.)

Haskell, H. N.—B.S.A., Florida, 1927; "Organization and Profits of Alachua County Farms." (*Florida*, 1929).

Hauch, C.—B.S., Ohio, 1920; "An Economic Study of the Ohio Apple Industry." (*Ohio*, 1927.)

Himmel, J. P.—B.S., Northwestern, 1910; "Farm Tenancy in Palo Alto County, Iowa." (*Iowa State*, 1928.)

Hines, F. R.—B.S.A., Tennessee, 1913; (Not determined.) (*Tennessee*, 1931.)

Hollister, H. I.—B.S., Kansas State, 1927; "Some Factors which Influence the July Price of No. 2 Mixed Corn at Kansas City." (*Kansas State*, 1928.)

Hornung, T. G.—B.S., Nebraska, 1922; "Influence of Age of Sows on Economy of Pork Production." (*Illinois*, 1928.)

Hudgins, Martha E.—A.B., Cornell, 1922; "A Statistical Study of the Farm Income and Household Expenses on Fifty-four Farms in the Chenango Valley, 1921-25." (*Cornell*, 1928.)

Hug, L. L.—B.S., Pennsylvania State, 1924; "Social Survey of a Pennsylvania Rural Community." (*Pennsylvania State*, 1928.)

Innis, R. R.—B.S., Ohio, 1928; "The Elasticity of the Supply of Milk." (*Ohio*, 1929.)

Jackson, E. L.—B.S., Ohio, 1925; "The Farmer's Source of Market News." (*Ohio*, 1928.)

Jackson, R. C.—B.S., Oregon, 1906; "A Study as to the Feasibility of a Coöperative Butter Marketing Agency for Oregon Creameries." (*Oregon*, 1928.)

Johanningsmeier, O. G.—B.S.A., Purdue, 1925; "Problems of Stabilizing Markets for Farm Products." (Purdue, 1928.)

Jordan, G. L.—B.S., Purdue, 1922; "Factors Affecting the Selling Price of Farm Lands with Special Reference to Champaign County, Illinois." (*Illinois*, 1928.)

Kapur, R. D.—B.Sc., California; "Agricultural Economic Conditions in the Punjab." (*Columbia*, 1928.)

Kaufman, C. H.—B.S., Pennsylvania State, 1924; "Boys' and Girls' 4-H Club Work." (*Virginia Polytechnic*, 1928.)

Kelsey, L. D.—B.S., Massachusetts Agricultural College, 1917; (Not determined.) (*Cornell*)

Kirk, H. A.—B.S., Utah, 1925; "A Study of the Economic Relationships of the International Smelter in Tooele Valley, Utah." (*Utah*, 1928.)

Knoll, P. X.—B.S., Oregon, 1923; "A Study of Wheat Storage in the Country and Terminal Elevators of the Pacific Northwest." (*Oregon*, 1929.)

Knowles, W. F.—A.B., Harvard, 1912; "Poultry Prices." (*Cornell*, 1929.)

Koughan, A.—B.S., California, 1926; (No thesis.) (*California*, 1928).

Lamont, T. E.—B.S., Cornell, 1927; "Cost of Producing Apples on Newfane Farms, Niagara County, in 1926." (*Cornell*, 1928.)

Lane, F. P.—B.S., Oklahoma A. & M., 1913; "An Agricultural Survey of the Shoshone Project." (*Wyoming*, 1928.)

Langsford, E. L.—B.S., Kentucky, 1923; "System of Beef Cattle Farming in Southwestern Virginia." (*Iowa State*, 1928.)

Larson, L. J.—B.S.A., Florida, 1928; (Not determined.) (*Florida*, 1929.)

Lin, C. G.—B.S., Illinois, 1928; "Government Bureau Organization for Research, Regulation and Extension Service in Agricultural Economics in the United States." (*Illinois*, 1929.)

Lindstrom, D. E.—B.S., Nebraska, 1924; "The Program in Rural Community Organization." (*Wisconsin*, 1928.)

Little, J. E.—B.S.A., Purdue, 1927; "An Analysis of Farm Operations in Central Indiana." (*Purdue*, 1928.)

Luney, K. D.—A.B., Geneva, 1924; "Land Redistribution in Roumania and Czecho-Slovakia, 1917-1927; (*Illinois*, 1928.)

Maddox, J. G.—B.S., Arkansas, 1927; "An Economic Study of the Dairy Industry in Arkansas." (*Arkansas*, 1928.)

Magruder, J. W.—B.S., Maryland, 1925; (Not determined.) (*Cornell*, 1930.)

Marshall, J.—B.S., Cornell, 1926; "A Study of Membership Relations and Field Service Problems of the Milk Marketing Organizations in the New York Milk Shed." (*Cornell*, 1928.)

Masters, F. N.—B.S., Iowa State, 1927; "Sweet Clover in Relation to Types of Farming in Iowa." (*Iowa State*, 1928.)

McAlpin, R.—B.S.A., Kentucky, 1922; "Effect of Industrial Development on Rural Welfare." (*Tennessee*, 1928.)

McCarthy, H. T.—B.S., Connecticut, 1925; "A Study of the Farmers' Public Wholesale Market Situation in New Haven." (*Connecticut*, 1928.)

McConnell, E. J.—B.S., Illinois, 1926; "A Study of the Cost of Harvesting Corn by Different Methods." (*Illinois*, 1929.)

McNelly, C. L.—B.S., Minnesota, 1909; (Not determined.) (*Minnesota*, 1931.)

Mills, O.—B.S., South Dakota, 1917; "The Wool Growers' Attitude toward Coöperative Marketing." (*Oregon*, 1928.)

Montgomery, C. A.—B.S., Virginia Polytechnic, 1916; "Leadership as a Force in 4-H Club Work." (*Virginia Polytechnic*, 1928.)

Montgomery, J. T.—B.S., Purdue, 1914; "An Economic Survey of the Minidoka Area." (*Idaho*, 1928.)

Moore, R. L.—B.S., Ohio, 1926; "The Relation of Income to Taxes on Ohio Farms." (*Ohio*, 1929.)

Muller, F. F.—B.S., Cornell, 1926; (Not determined.) (*Cornell*, 1929.)

Negaard, O. A.—B.S., Minnesota, 1926; "Marketing Locally Grown Raspberries in Minnesota," (*Minnesota*, 1928.)

Nichols, R. D.—B.S., Kansas State, 1920; "An Agricultural Program for Bourbon County, Kansas." (*Kansas State*, 1928.)

Oderkirk, A. N.—B.S., North Dakota, 1926; "Standardization of Eggs in the Producing Section." (*Iowa State*, 1928.)

Oldroyd, L. T.—B.S., Utah; (Not determined.) (*Wyoming*, 1929.)

Overton, M. H.—B.S.A., Purdue, 1916; "A Study of the Cost of Fattening Cattle in Indiana." (*Purdue*, 1928.)

Owen, E.—B.A., "Possibilities of Increasing Farm Profits in East Central Iowa by Farm Re-Organization." (*Iowa State*, 1928.)

Page, W.—B.S., Clemson, 1927; "Effect of Taxation upon the Development of Forestry." (*Texas A. & M.*, 1928.)

Palmer, C. D.—B.S., Massachusetts, 1926; "An Economic Study of Broomcorn Production in Illinois." (*Illinois*, 1928.)

Parker, B.—B.A., California, 1927; (No thesis.) (*California*, 1928.)

Pearson, H. W.—B.S., Wyoming; (Not determined.) (*Wyoming*, 1930.)

Penlinger, H.—B.S., Ohio, 1924; "The Movement of Dairy Products into and out of Ohio." (*Ohio*, 1927.)

Phillips, C. D.—B.S.A., Colorado, 1923; Significance of Economic Information in the Distribtuion of Farm Products." (*Purdue*, 1928.)

Pingrey, H. B.—B.S., Colorado, 1924; "Trends in Wheat Production in Minnesota." (*Minnesota*, 1928.)

Polson, R. A.—B.S., Wisconsin, 1927; "Appraisal Forms for Rural Communities." (*Wisconsin*, 1928.)

Powell, B. B.—B.S., Maryland, 1927; "The Marketing of Livestock in Maryland, with particular reference to the Baltimore Market." (*Maryland*, 1928.)

Powell, J. C.—B.S.A., Tennessee, 1920; "Farm Taxation in Tennessee." (*Tennessee*, 1929.)

Procter, R. E.—B.S., Kentucky, 1927; "Factors for Profitable Farming in Green, Taylor, and Adair Counties, Kentucky." (*Kentucky*, 1929.)

Purnis, H. A.—B.S., Ohio, 1914; "The Most Suitable Small Package for Marketing Ohio Apples." (*Ohio*, 1928.)

Quayle, W. L.—B.S., Utah; (Not determined.) (*Wyoming*, 1930.)

Rabinowitz, J.—B.S., Connecticut, 1926; "History of Coöperation in Connecticut Valley Tobacco." (*Massachusetts Agricultural*, 1929.)

Ranney, W. P.—B.S., Illinois, 1917; "A Study of Trends in Size of Farms with Special Reference to Illinois," (*Illinois*, 1928.)

Raxson, A. M.—B.S., Pennsylvania State, 1927; "Socializing Factors in Tioga County, Pennsylvania," (*Pennsylvania State*, 1928.)

Renne, R. R.—B.S., Rutgers, 1927; "The Relation of the Federal Reserve System to the Agricultural Depression beginning in 1926." (*Wisconsin*, 1928.)

Reynolds, Laura, B.S., Pennsylvania State, 1922; "Boys' and Girls' 4-H Club Work with Special Refernce to Iowa." (*Iowa State*, 1928.)

Robinson, J. L.—B.S.A., Tennessee, 1919; "An Economic and Social Survey of Monroe County, Tennessee." (*Tennessee*, 1930.)

Robinson, T. L.—B.S.A., Tennessee, 1915; "Farmers' Coöperative Organizations in Tennessee." (*Tennessee*, 1928.)

Rogers, F.—B.S., Mississippi A. & M., 1915; (Not determined.) (*Florida*, 1930.)

Rossiter, F. J.—B.S., Iowa State, 1920; "The Individual Farmer's Problem of Adjusting Hog Production to Changing Prices of Hogs and Corn." (*Iowa State*, 1928.)

Rothrock, L. F.—B.S., Pennsylvania State, 1921; (Not determined.) (*Pennsylvania State*)

Rouse, W. L.—B.S., Kentucky, 1921; "An Analysis of the Man Labor and Horse-Work Requirements of Major Farm Crops in Central Kentucky." (*Kentucky*, 1928.)

Rowe, C. W.—B.S., Pennsylvania State, 1927; "The Agriculture in York County, Pennsylvania." (*Cornell*, 1928.)

Rowell, J. N.—B.S., Missouri, 1927; "A Study of Price Variations in a Group of Staple Commodities." (*Missouri*, 1928.)

Rule, G. K.—B.S.A., Ohio, 1917; "The Value of Advertising to Coöperative Organizations in Marketing a Particular Farm Product." (*Cornell*, 1930.)

Sallee, G. A.—B.S., Illinois, 1925; "Pork Production in Relation to Farm Organization and Income with Special Reference to Steele County, Minnesota." (*Minnesota*, 1928.)

Schultz, T. W.—B.S., South Dakota, 1927; "The Effect of Taxation Upon the Price of Land." (*Wisconsin*, 1928.)

Schumaker, R. I.—B.S., Texas A. & M., 1927; "Cost of Producing Agricultural Products in North Carolina." (*North Carolina State*, 1929.)

Scott, C. O.—B.S.A., Wisconsin, 1916; "Some Forms of Coöperation in Colorado." (*Colorado*, 1928.)

Seeley, B. D.—B.S., Colorado, 1926; "Taxes as they affect the Rural Taxpayer." (*Colorado*, 1928.)

Schuman, C. B.—B.S., Illinois, 1928; (Not determined.) (*Illinois*, 1929.)

Sorden, L. G.—B.S., Iowa State, 1923; (Not determined.) (*Wisconsin*, 1930.)

Stempfle, W. S.—B.S., Cornell, 1920; (Not determined.) (*Cornell*)

Stern, J. K.—B.S., Pennsylvania State, 1927; (Not determined.) (*Pennsylvania State*)

Termohlen, W. D.—B.S., Iowa State, 1925; "Egg Marketing in Iowa." (*Iowa State*, 1928.)

Thibodeaux, B. H.—B.S., Louisana, 1925; "Types of Farm Organization in a Cash-Grain Area in Iowa." (*Iowa State*, 1928.)

Thorne, G. B.—B.S., Missouri, 1925; "Cost of Producing Strawberries in Southwest Missouri and its Relation to Acreage." (*Missouri*, 1928.)

Throckmorton, H. E.—B.S., Ohio, 1928; (Not determined.) (*Cornell*, 1930.)

Toussaint, W.—B.S., North Dakota, 1926; "Land Tenancy and Ownership as Applied to Slope County, North Dakota," (*North Dakota*, 1928).

Turner, R. M.—B.S., Washington State, 1916; (Not determined.) (*Cornell*)

Underwood, F. L.—B.S., Illinois, 1927; (Not determined.) (*Illinois*, 1930.)

Vinson, A. G.—B.S., Kansas State, 1915; "A Comparison of the Economic and Social Status of Farmer Subscribers and Non-Subscribers to Farm Journals and Daily Newspapes." (*Oklahoma A. & M.*, 1928.)

Wehrwein, C. F.—B.S., Wisconsin, 1915; "The Pre-Ownership Steps up the Agricultural Ladder of 201 Farmers in a Low Tenancy Region." (*Wisconsin*, 1928.)

White, H. G.—B.S., Utah, 1925; "Wool Marketing." (*Cornell*, 1928.)

Williams, J. G.—B.S., Banger, Wales, 1925; "The Application of Opportunity Costs to Farm Accounting." (*Wisconsin*, 1928.)

Wixson, E. A.—B.S., Maine, 1928; "An Economic Study of the Potato Industry in Maine." (*Maine*, 1929.)

Wood, D. C.—B.S., Missouri, 1914; "The Use of the Mail Survey in Farm Management Demonstrations." (*Missouri*, 1928.)

Woodrum, M.—B.S., Texas A. & M., 1927; "Causes of Changes in Differences in Grade and Staple of Cotton." (*Texas A. & M.*, 1928.)

Wright, K. T.—B.S., Illinois, 1924; "Dairying in Relation to Farm Management." (*Illinois*, 1928.)

Wrigley, P. I.—B.S., Pennsylvania State, 1909; "The Trend in Expenditure of Local Tax Money in Pennsylvania." (*Pennsylvania State*, 1928.)

Zentgraf, R. L.—B.S., Cornell, 1927; "An Economic Study of Plant City Truck Farms." (*Florida*, 1929.)

SUMMARY OF THE LISTS OF CANDIDATES, 1927 AND 1928

Prepared by K. A. H. Murray and F. A. Harper, Cornell University

In 1927, there were 83 candidates for the degree of Doctor of Philosophy and 110 candidates for the Master's degree majoring in Agricultural Economics in 42 institutions in the United States.[1] In 1928, there were 102 students working for the Doctorate, or 23 per cent more than in 1927, and 150 studying for the Master's degree, or 36 per cent more than in 1927. (Tables 1 and 2.)

In 1928, the same number of institutions (13) reported students working for the Doctorate, as in 1927. Candidates for the Master's degree were working at 33 institutions in 1928 as compared with 28 in 1927.

A study of the list of candidates in 1927 for the degree of Doctor of Philosophy shows that they completed their undergraduate work in 36 different institutions. Of the 83 candidates, 59 per cent had a Master's degree from one of 18 different institutions. The other 41 per cent intended to take the degree of Doctor of Philosophy without a preliminary higher degree. Of the total number in 1927, 76 per cent were working for the degree of Doctor of Philosophy at three institutions, Cornell, Minnesota, and Wisconsin.

The 102 candidates in 1928 for the degree of Doctor of Philosophy obtained their undergraduate degree in 42 different institutions. Of the total number, 59 per cent had taken a higher degree before working for the Doctorate, which was practically the same percentage as in 1927. The Master's degree had been obtained in 18 different universities or colleges. In 1928, the candidates for the degree of Doctor of Philosophy were more

[1] JOURNAL OF FARM ECONOMICS, Vol. 9, No. 3, pp. 393-400, July, 1927.

TABLE 1. NUMBER OF CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN AGRICULTURAL ECONOMICS AT NAMED INSTITUTIONS 1927 AND 1928

Institution	1927	1928	1927	1928
	Number	*Number*	*Per cent*	*Per cent*
Cornell	38	34	45.8	33.3
Minnesota	20	20	24.2	19.6
Wisconsin	6	14	7.2	13.7
Harvard	3	7	3.6	6.9
Illinois	3	6	3.6	5.9
California	3	4	3.6	3.9
Ohio	1	5	1.2	4.9
Iowa	2	3	2.4	2.9
Maryland	2	3	2.4	2.9
Pennsylvania	1	2	1.2	2.0
Chicago	–	2	—	2.0
Michigan	2	–	2.4	—
Brookings Institution	–	1	—	1.0
Northwestern	1	–	1.2	—
Rutgers	–	1	—	1.0
Leland Stanford	1	–	1.2	1.0
Total	83	102	100.0	100.0

TABLE 2. NUMBER OF CANDIDATES FOR THE MASTER'S DEGREE IN AGRICULTURAL ECONOMICS AT NAMED INSTITUTIONS 1927 AND 1928

Institution[1]	1927	1928	1927	1928
	Number	*Number*	*Per cent*	*Per cent*
Minnesota	20	12	18.3	8.1
Cornell	9	22	8.3	14.7
Ohio	11	9	10.1	6.0
Illinois	8	11	7.3	7.3
Pennsylvania	4	12	3.6	8.0
Kansas	8	4	7.3	2.7
Wisconsin	1	11	0.9	7.3
Florida	5	5	4.5	3.3
Iowa	–	10	—	6.6
Purdue	5	5	4.5	3.3
Oklahoma	6	2	5.5	1.3
Texas	5	3	4.5	2.0
Missouri	4	3	3.6	2.0
Tennessee	–	7	—	4.7
Idaho	3	2	2.7	1.3
Kentucky	1	3	0.9	2.0
Maine	2	2	1.8	1.3
North Carolina	2	2	1.8	1.3
North Dakota	2	2	1.8	1.3
Oregon	–	4	—	2.7
Utah	3	1	2.7	0.7
Vermont	2	1	1.8	0.7
Virginia Polytechnic	–	3	—	2.0
Massachusetts Agricultural	–	2	—	1.3
Connecticut	1	1	0.9	0.7
California	–	2	—	1.3
Chicago	–	2	—	1.3
Maryland	1	1	0.9	0.7
Colorado	–	2	—	1.3
Michigan	1	1	0.9	0.7
Arkansas	–	1	—	0.7
Arizona	1	–	0.9	—
Delaware	1	–	0.9	—
Georgia	–	1	—	0.7
Nebraska	1	–	0.9	—
New Jersey	1	–	0.9	—
South Dakota	1	–	0.9	—
Virginia	1	–	0.9	—
Wyoming	–	1	—	0.7
Total	110	150	100.0	100.0

[1] Arranged by total number of students for the two years at each institution.

evenly distributed among all the institutions having such candidates than in 1927; the percentage at Cornell, Minnesota and Wisconsin declined from 77.2 per cent of the total number in 1927 to 66.6 per cent in 1928.

Of the total number of students in both years working for either of the advanced degrees, 47 per cent were at the same institution at which they took their undergraduate work. Of the candidates for the Master's degree, however, 58.8 per cent remained at the same institution at which they completed their undergraduate work, and for the degree of Doctor of Philosophy 33.5 per cent.

By taking the year in which the Bachelor's degree was obtained and the year when the candidate expected to obtain the advanced degree for which he was working, it was possible to measure the length of time elapsing between the completion of undergraduate study and of advanced work. (See Table 3.) The number of years between the Bachelor's degree and the Master's degree ranged from one to thirty-two. For 24 of the candidates in 1927 and 27 of those in 1928 the time elapsing was only one year. The number of years between the Bachelor's degree and the Doctor's degree ranged from three to twenty-four, but only 2 of those studying in 1927 and 6 of those in 1928 were completing their graduate work within three years after receiving their Bachelor's degree.

TABLE 3. TIME ELAPSING BETWEEN COMPLETION OF UNDER-GRADUATE STUDY AND THE PROBABLE COMPLETION OF ADVANCED WORK IN AGRICULTURAL ECONOMICS 1927 AND 1928

Number of years	Candidates for Master's degree		Candidates for degree of Doctor of Philosophy	
	1927	1928	1927	1928
	Number	Number	Number	—
1	24	27	—	—
2	19	22	—	6
3	6	19	2	11
4	5	10	11	9
5	2	4	7	14
6	1	7	14	13
7	7	4	4	8
8	2	5	4	2
9	1	1	2	—
10	3	—	5	5
11	4	6	3	4
12	2	7	3	5
13	1	6	2	3
14	—	4	3	5
15	3	3	3	2
16	—	2	3	2
17	—	1	1	—
18	—	2	1	5
19	—	1	2	—
21	1	1	1	—
22	—	3	—	1
24	1	—	—	—
25	1	—	—	—
32	—	1	—	—

Information of this point not available for 27 candidates for Masters Degree in 1927, 14 candidates for Masters Degree in 1928, 12 candidates for degree of Doctor of Philosophy in 1927, and 7 in 1928.

EDITOR'S NOTE: After this summary was submitted 8 names were added to the lists in proof: Doctors—Columbia, 1; Purdue, 1; Masters—Columbia, 2; Wyoming, 4. These numbers have not been worked into the computations.